Blackmer System One® heavy duty centrifugal pumps are designed and constructed to provide maximum service life. Heavy duty Blackmer System One pumps comply with key parts of the API 610 standard for centrifugal pumps and can be a cost effective alternative to pumps that are in full compliance with the standard.*

This bulletin describes how Blackmer System One pumps comply with key clauses found in the basic design section of the 11th edition of API Standard 610. In some cases, compliance requires optional features. Users of this document are urged to obtain a copy of the standard from API to make a full comparison.

6.1.1
All Blackmer System One pumps are designed and constructed to meet the minimum standard of a 20 year service life and 3 years uninterrupted operation.

6.1.23
All Blackmer System One pumps incorporate a special oil fill cap and magnetic drain plugs to minimize ingress of contaminants and to mitigate the effects of contaminants that do get in. LD17 and Frame-A models also incorporate a flinger filter.

6.3.11
- Blackmer System One LD17 and Frame-A models incorporate center-line support including center-line mounting feet as standard.
- Blackmer System One Frame-S models do not incorporate casing support feet.
- Blackmer System One Frame-M models have an option for center-line support.

6.4.2
ANSI/ASME class 300 flanges are an available option on all Blackmer System One pumps.

6.4.3.14
All Blackmer System One pumps with standard top discharge are self-venting and have threaded casing drains available as an option (standard on Frame-M). Flanged drains are available as a special option. Pumps with optional side discharge have standard vents, but drains are not available. (Side discharge is not available on Frame-S.)

6.6.1
All Blackmer System One impellers are the semi-open type. The running clearance can be adjusted using standard micrometer adjusting nuts located on the bearing housing.

6.6.2
All Blackmer System One impellers are single piece castings.

6.6.3
All Blackmer System One standard impellers are threaded to the shaft. Impeller lock bolts are available as an option. Keyed impellers are available as a special option.

6.6.5
All Blackmer System One impellers have solid hubs.

6.9.1.3
Mid-size Blackmer System One Pumps are offered in two variants to meet the differing needs of purchasers.

- The LD17 variant complies with the requirement for maximum shaft deflection.
- The Frame A variant does not comply. It has a longer seal chamber which is designed to accommodate longer seals.

Small size (Frame-S) and large size (Frame-M) models do not comply.

6.10.1.4
A pair of 7000 series angular contact thrust bearings is standard in Blackmer System One LD17, Frame-A, and Frame-M models; and is optional for the Frame-S model.

6.10.2
All Blackmer System One bearing housings can be removed from service without disturbing the driver, provided that a spacer coupling of sufficient length is used in unit assemblies. Sufficient cooling is achieved with a large oil sump and deep cooling fins. For extreme temperature operations, a copper coiling coil is an available option. Labyrinth seals are standard equipment.

6.12
Blackmer System One pumps are offered with standard and optional materials that comply with the material classes in table H.1 as follows:

I-1 and I-2

- Blackmer System One standard ductile iron casing (A395 60-40-18) is superior to the compliant cast iron casing (A278 class 30).
- Blackmer System One standard duplex stainless impeller (A890 CD4MCu A1) is superior to the I-1 compliant cast iron impeller, and is superior to the compliant I-2 copper impeller for many applications. Compliant cast iron and copper impellers are not available for Blackmer System One.
- Blackmer System One standard shaft is bimetallic. The wet end of the shaft is either A276 T316 stainless or A564 T630 (17-4Ph) stainless depending on pump size and speed, and the carbon steel portion is A29 1018. Both offer superior corrosion resistance compared to the compliant 1045 shaft. A576 1045 shaft is available as an option.

S-4 and S-5

- Optional cast steel casing (A216 WCB) complies with the requirement.
- Blackmer System One standard duplex stainless impeller (A890 CD4MCu A1) is superior to the compliant WCB impeller. A216 WCB impeller is available as an option.
- Blackmer System One standard shaft is bimetallic. The wet end of the shaft is either A276 T316 stainless or A564 T630 (17-4Ph) stainless depending on pump size and speed, and the carbon steel portion is A29 1018. Both offer superior corrosion resistance compared to the compliant shaft materials. S-4 compliant A576 1045 and S-5 compliant A434 4140 shafts are available as options.

S-6 and S-8

- Optional cast steel casing (A216 WCB) complies with the requirement.
- Blackmer System One standard duplex stainless impeller (A890 CD4MCu A1) is superior to the compliant impellers for most applications. S-6 compliant A743 CA15 and S-8 compliant A743 CF3M impellers are available as options.
- Blackmer System One standard shaft is bimetallic. The wet end of the shaft is either A276 T316 stainless or A564 T630 (17-4Ph) stainless depending on pump size and speed, and the carbon steel portion is A29 1018. S-6 compliant A434 4140 and S-8 compliant A276 316L shafts are both available as options.

A-8

- Optional stainless casing (A351 CF3M) complies with the requirement.
- Blackmer System One standard duplex stainless impeller (A890 CD4MCu A1) is superior to the compliant CF3M impeller for many applications. A743 CF3M impeller is available as an option.
- Blackmer System One standard shaft is bimetallic. The wet end of the shaft is either A276 T316 stainless or A564 T630 (17-4Ph) stainless depending on pump size and speed, and the carbon steel portion is A29 1018. Compliant A276 316L shaft is available as an option.

I-1, I-2, S-4, S-5, S-6, S-8, and A-8

- Blackmer System One standard casing and gland studs are A193 B8M and casing bolts on 13" pumps are A593 A90 which offer superior corrosion resistance compared to compliant A193 B7. A193 B7 is available as an option.
- Blackmer System One available materials for casing gasket include:
    - Carbon Fiber with Nitrile Binder (standard)
    - Reinforced Graphite No Binder (optional)
    - Reinforced PTFE (optional)
    - Pure PTFE (optional)

  Compliant AUS Spiral Wound Gasket is available as a special option.
- Blackmer System One standard pumps have no throat bushing. Carbon throat bushing is an available option. Other throat bushing materials are not available.

(Note that Blackmer System One pumps do not incorporate these items so no comment is made regarding compliance: Inner Case Parts, Case Wear Rings, Impeller Wear Rings, Interstage Sleeves, Interstage Bushings, Cans, Shaft Bushings, and Wetted Fasteners)

*Note:

The scope of the standard is defined in clause 1. Full compliance pumps operating where none of the following conditions are exceeded may not be cost effective.

- 1900 kPa (275 psig; 19 bar) discharge pressure
- 500 kPa (75 psig; 5 bar) suction pressure
- 150°C (300°F) pumping temperature
- 3600 rpm
- 120 m (400 ft.) rated total head
- 330 mm (13 in) impeller diameter

Blackmer System One pumps are built to exceed the above limits for pressure, temperature, and head. Please consult PSG, Grand Rapids regarding the design limits of Blackmer System One heavy duty centrifugal pumps.

Please consult with PSG, Grand Rapids for a complete list of exceptions to the API 610 standard, 11th edition.

blank