

Page Number	Form 588
Effective	Mar 2015
Replaces	New

The following are typical of the documents that Blackmer will provide. The actual appearance of material reports will depend on the source vendor documents.

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MC - MATERIAL CERTIFICATE - Actual Physical and Chemical Data

Material Certificate - ACTUAL									
			1809 Century Avenue SW Grand Rapids, MI 49503-1530 Phone: 616 241 1611 • Fax: 616 241 3752						
			Customer	Product Model	Authorized Representative				
Blackmer Order #	Serial Number	Date							
Supplier									
Part #									
Name									
Date									
Specification									
Grade									
Heat #									
Chemical Composition									
C									
Mn									
Si									
P									
S									
Cu									
Cr									
Mo									
Ni									
Al									
V									
Sn									
Ti									
B									
Zr									
Co									
Zn									
Pb									
N									
Sb									
Physical Properties									
Tensile (PSI)									
Harness									
Yield (PSI)									
Elong.									
Area Reduction									
This document is validated by Blackmer's authorized inspection representative independent of the manufacturing department. The products supplied are in compliance with the requirements of the purchase order. Data is validated in conformance with EN 10204:2004 (E) type 3.1									

Data for actual physical and chemical certificate is derived directly from records of specific inspections of material poured for the listed castings that are used in the actual pump construction. Validation for actual physical and chemical conforms to EN 10204:2004 (E) type 3.1. Material Certificates may not be available for some items that are not poured by Blackmer.

Must be ordered with product to be certified. Not available for online orders. Lead-time will be extended, in some cases significantly – Consult Factory.



MCM – MATERIAL CERTIFICATE WITH ACTUAL MICROSTRUCTURE PHOTO
Actual Physical, Chemical, and Microstructure Photo

Report No:
Report Date:

Client Reference:
Received on:

**Subject: Microstructural Evaluation of a Cast Carbon Steel Specimen (Grade LCB)
Identified as Heat No. 81089**

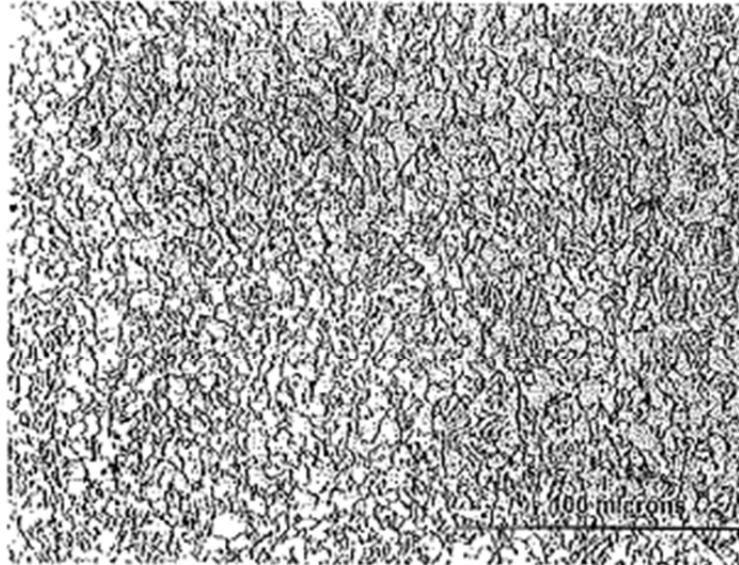


Figure 1- The metallographic specimen identified as Heat No. 81089 reveals a microstructure that consists primarily of ferrite (white) and pearlite (darker etching). 2% Nital. (approximately 400X magnification).

It is our policy to retain components and sample remnants for a minimum of thirty (30) days from the report date, after which time they may be discarded. The data herein represents only the item(s) tested. This report shall not be reproduced, except in full, without prior permission of [redacted] Corporation.

Respectfully Submitted,

Senior Metallurgist

Not available without actual physical and chemical (See previous page.) Actual microstructure photo is derived from specific photos of material poured for listed castings used in the actual pump construction. Validation for actual microstructure photos conforms to EN 10204:2004 (E) type 3.1. Material Certificates may not be available for some items that are not poured by Blackmer.

Must be ordered with product to be photographed. Not available for online orders. Lead-time will be extended, in some cases significantly – Consult Factory.

Blackmer

MR - MATERIAL REPORT - Typical Physical and Chemical

Material Certificate - TYPICAL



1809 Century Avenue SW
 Grand Rapids, MI 49503-1530
 Phone: 616 241 1611 • Fax: 616 241 3752

Customer	Product Model	Authorized Representative
Blackmer Order #	Serial Number	Date
Supplier		
Part #		
Name		
Date		
Specification		
Grade		
Heat #		

Chemical Composition		
C		
Mn		
Si		
P		
S		
Cu		
Cr		
Mo		
Ni		
Al		
V		
Sn		
Ti		
B		
Zr		
Co		
Zn		
Pb		
N		
Sb		

Physical Properties		
Tensile (PSI)		
Harness		
Yield (PSI)		
Elong.		
Area Reduction		

This document is validated by Blackmer's authorized inspection representative independent of the manufacturing department.
 The products supplied are in compliance with the requirements of the purchase order.
 Data is validated in conformance with EN 10204:2004 (E) type 2.2

Data for typical physical and chemical certificate is derived from records of non-specific inspections of material poured for listed castings. The products inspected are not necessarily the products actually supplied. Validation for typical physical and chemical conforms to EN 10204:2004 (E) type 2.2.

Typical MATERIAL REPORTS are not available for all items – consult factory for availability. If a MATERIAL REPORT is not available, a MATERIAL CERTIFICATE may be required for additional cost. Pricing is for reports ordered with the product.





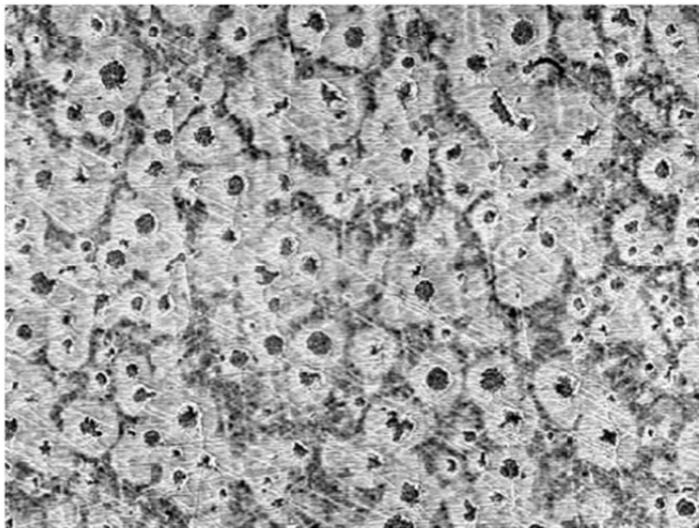
MATERIALS TESTING CERTIFICATE
ASTM A536

CUSTOMER _____
ASTM SPEC. _____
SERIAL NO.: _____

ORDER NO. _____
MODEL NO. _____

Typical Microphoto (100X)

The graphite is spheroidal in shape. Ferritic matrix with 20% to 40% pearlite. No carbides.



This microstructure photograph is a typical representation of the material identified above. The sample that this microstructure photo was taken from is the same material type and was made using the same manufacturing methods as the product supplied.

Typical microstructure photo is derived from non-specific photos of material used in a typical pump construction. The products inspected are not necessarily the products actually supplied. Validation for typical microstructure photo conforms to EN 10204:2004 (E) type 2.2.

Typical Microstructure Photos are not available for all items, particularly for items not poured at Blackmer – consult factory for availability. If a typical photo is not available, an actual photo may be required for additional cost. Pricing is for reports ordered with the product.



PMI - POSITIVE METAL IDENTIFICATION REPORT - Actual Chemical

PMI Material Certificate



1809 Century Avenue SW
Grand Rapids, MI 49503-1530
Phone: 616 241 1611 • Fax: 616 241 3752

Customer _____ Product Model _____ Authorized Representative _____
 Blackmer Order # _____ Serial Number _____ Date _____

Supplier																			
Part #																			
Name																			
Date																			
Specification																			
Grade																			

The Chemical composition below is determined with a **PMI** (Positive Metal Identification) method. Blackmer uses an XRF technology instrument utilizing X ray fluorescence to determine the chemical content of the components verifying correct engineered materials.

Chemical Composition

C																			
Mn																			
Si																			
P																			
S																			
Cu																			
Cr																			
Ni																			
Mo																			
V																			
Al																			
Ti																			
N																			
Co																			
Zn																			
Sn																			
W																			
Pb																			

This document is validated by Blackmer's authorized inspection representative independent of the manufacturing department.

G:\DEPT\MFG\MFGALL\ASSY SCHEDULE\Certs\Forms\Material Certificate Type 4 PMI Method.xlsx

The Purpose of PMI is to establish that the correct material type is being used. It is not intended to be used for complete chemical analysis. It is a nondestructive means to determine the metallurgy of finished parts using XRF technology. Data for PMI report is directly derived from specific testing performed using a Bruker model S1 Sorter.

- http://en.wikipedia.org/wiki/X-ray_fluorescence
- http://www.bruker.com/fileadmin/user_upload/8-PDF-Docs/X-rayDiffraction_ElementalAnalysis/HH-XRF/Brochures/S1_SORTER/S1_SORTER_Brochure.pdf



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QUALITY POLICY AND TEST CERTIFICATIONS

I) QUALITY POLICY

We will provide, to our internal and external customers, products and services, which achieve total satisfaction. We are committed to efficiently doing our jobs right the first time, every time, and on time.

Blackmer, as an important step in this policy, has obtained compliance with the ISO 9001 Quality Management System applicable to the Design and Manufacturing of Positive Displacement Pumps, Centrifugal Pumps, Compressors, Helical Gear Reducers, Bypass Valves and Related Hardware.



II) CERTIFICATE OF TEST

Customer Name: _____ Customer Order No.: _____
Blackmer Order No.: _____
Pump Model: PVS20A Serial No.: _____

This certifies that the pump identified by the above information at the time of manufacture met all test specifications as required by Blackmer’s Engineering Specification Release.

Hydrostatic Test: 300 psi Dry Vacuum: 6 in. hg.

Mechanical Run Test: YES Relief Valve Setting: 100 psi

III) MATERIAL TESTING CERTIFICATION

The manufacturing or processing works attests to the compliance of the casing material of the pump identified above is in agreement when the order was taken. This is done through routine works inspection testing of products made from the same material and the same manufacturing methods as the pump supplied. The material meets the following ASTM standards:

Material: 316 Stainless Steel ASTM: A743 grade CF-8M

These sections are certified by Blackmer’s Quality Assurance Department.

Data is based on standard non-witnessed testing performed on the subject product during routine production test. The report includes serial number of the subject product, test data, quality policy, and basic materials of construction as identified by a comparable industrial standard. The production testing varies by product model. Please see **form 587** for a description of routine production tests for vane pumps.

Vane Pumps sizes 1” thru 4”: Test data recorded includes dry-vac test, relief valve setting, and one minute hydrostatic test.

Some models include peak and/or shut off pressure in lieu of RV setting.

CRL includes dry-vac and pressurized leak test only.

Not available for hand pumps.

Vane Pumps sizes 6” thru 10”: Test data recorded includes dry-vac test, relief valve setting, one minute hydrostatic test, and flow at 230 rpm.

CRL includes dry-vac and pressurized leak test only.

Centrifugal Pumps: Test data recorded includes ten minute hydrostatic test only.



PRODUCTION TEST REPORT - Reciprocating Compressors



Cust. Name _____

Order # _____

COMPRESSOR TEST DATA SHEET

Model _____ ID# _____ Serial # _____

O-rings: Nitrile PTFE Neoprene FKM EPR Packing Type _____

Valves: Std. Opt. _____ Bolts Torqued External Oil Filter: No Yes

Piston Rings: Std. Opt. _____ Gaskets: Alum. Iron Shaft: Std. Ext.

Piston Rods: Std. Opt. _____ Compressor Only Unit

25 psig Oil Pressure Flywheel Runout: Radial O.D. (.016 max) _____ Axial Rim Face (.021 max) _____

Oil Pump Reversal 210 psig Suction Relief (LB Models) 180 Minute Run-In @ _____ RPM by: _____

Packing Seal Test Crankcase Oil Drained Orifice Pressure: _____ psig by: _____

Water Jacket Test Loose parts included 15 Minute Air Test @ _____ psig by: _____

Appearance / Paint Coverage Acceptable Warning Labels Attached Manual / Parts List attached

Notes: _____

SAMPLE

Assembled by _____ Tested by _____ Witnessed by _____ Test Date _____

Mounting Style: B TU LU TC LC LW TW Compressor RPM _____ Level Switch _____

Driver Sheave/Hub/Belts _____ / _____ / _____ Trap: Std ASME NB# _____

Driver: HP _____ Fr. _____ RPM _____ Encl. _____ Brand _____ Manual / Parts List attached

_____ Minute Air Test @ _____ psig Appearance / Paint Coverage Acceptable Warning Labels Attached

Notes: _____

Mounted by _____ Tested by _____ Witnessed by _____ Test Date _____

Optional Hydrostatic Pressure Test	_____ PSIG for _____ Minutes	Test # _____
Fluid: _____ @ _____ F	Tested By _____	Witnessed By _____

Finish Preparation By _____ Final Check By _____ Date _____

Each compressor is given a thorough regimen of standard tests and inspections both during and after assembly. The process is described in document **CB-288 COMPRESSOR STANDARD TEST PROCEDURES**. A report of these tests and inspections is available as a Production Test Report.





Certificate of Pressure Test

Customer Name:

Blackmer Order Number:

Model Number

Serial Number

Maximum Allowable Working Pressure

PSI

Test Pressure:

PSI

Test Material:

Crystal Clean 142

Test Specification:

ANSI/HI Rotary Pump 3.6-2000

Unless Otherwise Noted: Hydraulic Institute specifies Hydraulic Test pressure to be 1.5 times the maximum working pressure of the pump.

This certifies that the material described above has been tested by Blackmer and has satisfied the test specification requirements.

Notes:

Witnessed by:

Title: Quality Engineer

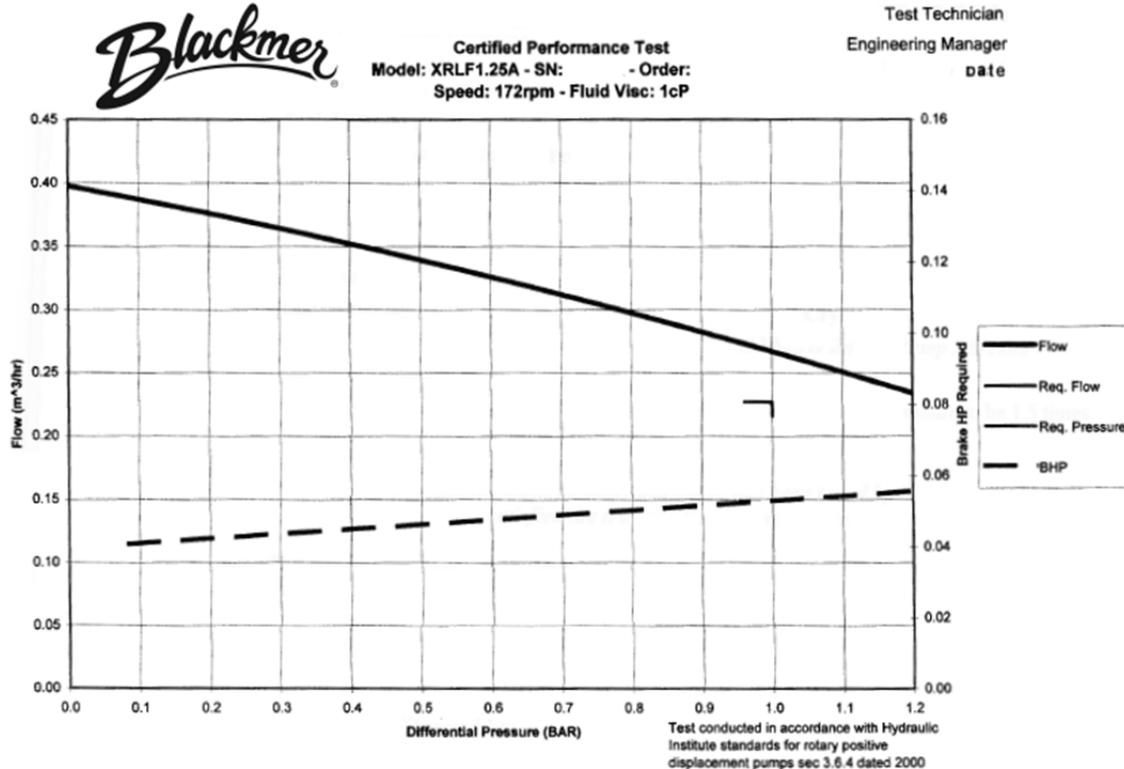
Date:

Tests are conducted in accordance with the Standards of the Hydraulics Institute for hydrostatic testing of rotary pumps. (HI 2000: 3.6) Pumps are tested at 1.5 times MAWP unless limited by included pump options.

- SGL and CRL pumps have special test procedures or criteria.
- Centrifugal pumps without seals are tested at the component level prior to assembly.



CERTIFIED PERFORMANCE TEST



Vane Pumps sizes 1" thru 4": Data recorded includes serial number, pump type, date of test, differential pressure, horsepower (pump only) or motor amperage (units), and capacity at various pressures. Tests are conducted at ambient temperature at one speed on a 30 SSU (1 cSt) fluid (unless otherwise specified) using shop driver.

200 gpm limit on test stand due to size of test fluid tanks.

Viscosity Notes:

Choose a single viscosity: 30 SSU; or from 100 SSU to 3,000 SSU. (No test fluid in house between 30 SSU and 100 SSU)

LG and LGL pumps are tested using 30 SSU test fluid.

At higher viscosity, maximum testable flow is reduced – consult factory.

Pumps with metal vanes require minimum viscosity – consult factory.

Stainless steel pumps are tested using water.

Not available for CRL or SGL pumps. (Production test report may be acceptable substitute.)

Not available for hand pumps.

Vane Pumps sizes 6" thru 10": Data recorded includes serial number, pump type, date of test, differential pressure, and capacity at various pressures. Tests are conducted at 230 RPM on a 30 SSU (1 cSt) fluid.

Due to limitations of test stand, other speeds and viscosities are not available.

Not available for CRL pumps. (Production test report may be acceptable substitute.)

Centrifugal Pumps: Data recorded includes serial number, pump type (size, rpm, and impeller trim), date of test, head/capacity at five points including the duty point, and power. Tests are conducted at one speed with water at ambient temperature on bare pumps using factory drives and standard test set-up. **Performance tests require permanent installation of a mechanical seal.** If a seal is not purchased from Blackmer, a seal must be supplied by the customer for installation prior to the test. There is a charge for installing customer supplied seals.

Tests are conducted at one duty point.

There is a 150hp limit on the test stand. High power duty points will be run at reduced speed with performance predicted by the affinity laws.

Reciprocating Compressors: Certified performance testing of compressors for actual duty conditions is not available. Blackmer does not have systems to store, use, or dispose of process gasses. Please see document CB-288 regarding production test reports as this may be adequate for the customer's need.



CERTIFIED NPSH TEST - Optional with certified performance test.

Test Technician _____

Lab Manager _____



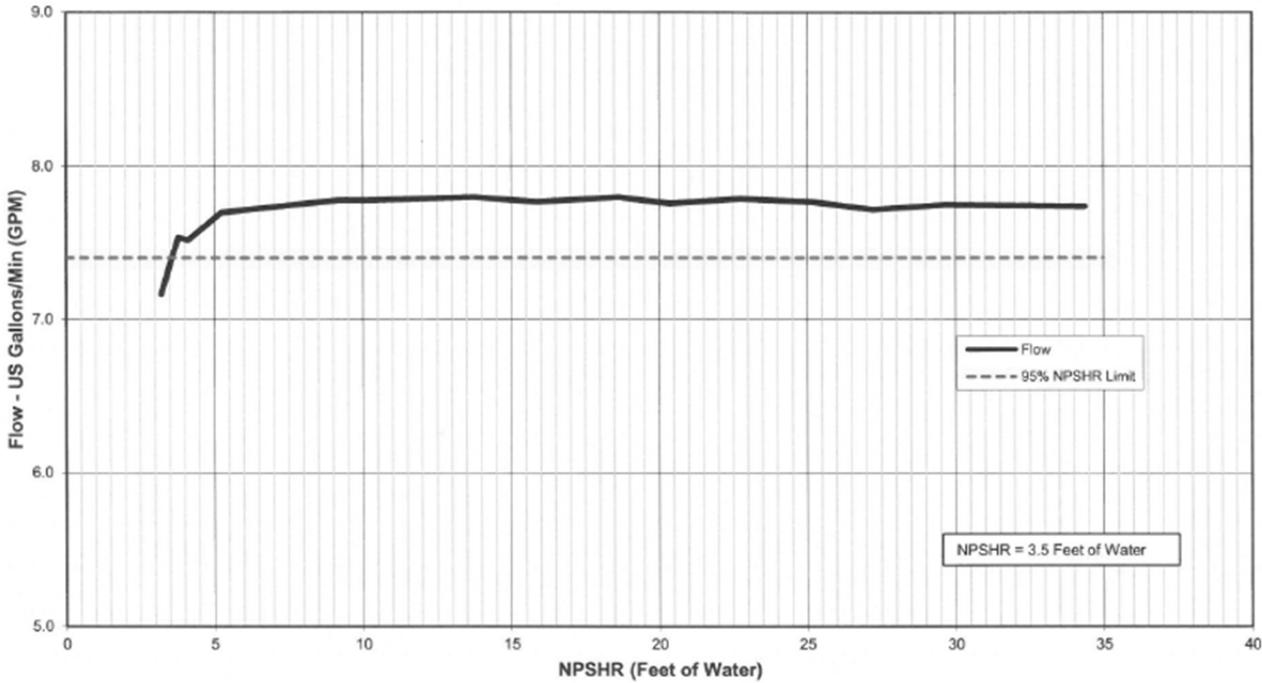
NPSHR Curve

Model: XL1.25 - S/N:

Order:

Tested: 2/3/2015

Speed: 637 RPM - Test Fluid: Water @78 °F



Test conducted in accordance with Hydraulic Institute standards for rotary positive displacement pumps per ANSI/HI 3.6-2000

Not available without performance test. Not available for HXL, CRL or SGL pumps, or pumps with metal or laminate vanes. Not available for centrifugal pumps producing more than 600 gpm due to size and configuration of test loop. NPSH tests are conducted using water.

- NPSH test for vane pumps will be conducted at 50 psi and the specified speed.
- NPSH test for centrifugal pumps will be conducted at one duty flow point.



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