NEVER COMPROMISE

Ohio Brass Brand

IEC Surge Arresters for Substation Application
The Ohio Brass Company is one of the operating companies of Hubbell Power Systems, Inc., a wholly owned subsidiary of Hubbell, Inc. headquartered in Orange, CT. Hubbell Power Systems (HPS) is a manufacturer of a wide variety of products for transmission and distribution needs of the electric utility industry. Ohio Brass manufactures insulators and arresters for all system voltages and applications, and cable accessories for underground (URD) systems.

Hubbell and Ohio Brass were both founded in 1888. Ohio Brass joined Hubbell in 1978. Our 100 plus years of electrical utility industry experience will continue to serve customers as we enter our second century of solutions.

Ohio Brass pioneered polymer high voltage insulation systems, basic metal oxide varistor (MOV) block technology and polymer housed surge arresters. Ohio Brass continues to thrive on developing new technologies and state of the art power products. New products show our commitment to the future. Ohio Brass is a strong, vibrant company with a solid reputation for design, quality, and service in the electric utility industry market.

THE FOLLOWING ARE SOME OF THE MAJOR EVENTS IN THE HISTORY OF OHIO BRASS.

1910 — Porcelain plant purchased in Barberton, Ohio.
1920 — Country’s first full scale outdoor electrical testing facility established in Barberton.
1950 — Introduced Surge Arresters
1957 — Patented Current Limiting Gap Arrester (SiC Arrester)
1964 — Ohio Brass begins development of organic insulation for transmission and distribution
1968 — Opened R&D Center Wadsworth, Ohio
1978 — Acquired by Hubbell
1978 — Opened MOV Block Plant for new MOV Arresters (replace SiC)
1986 — World’s First Polymer Distribution Arrester
1988 — Line Arrester for reliability improvement
1993 — Polymer Station Class Arrester 4 Millionth Line Arrester Shipped
2005 — PDV Optima Introduction
2007 — SVN/PH3 Introduction
2011 — EVP/MVN Introduction
• MOV blocks encased within a tightly woven fiberglass matrix impregnated with epoxy resin. Silicone dielectric compound lines the interface between fiberglass and rubber housing to render a void-free and hydrophobic assembly.

• Typically less than half the weight of comparable porcelain arresters. This makes transportation, handling and installation much easier.

• Pressure relief through polymer housing allows lower-pressure puncture while retaining components.

• Arrester design prohibits internal entrapment of air and leakage of air or moisture across hermetic seals.

• MOV block stack assembled within the porcelain housing between internal centering fixtures.

• Field-tested design with longest service history.

• Directional Pressure relief vent system triggered by puncture plate.

• Arrester sealing verified by two high vacuum analytic leakage tests.

• MOV block stack assembled within the fiberglass housing between internal centering fixtures.

• Nearly 50% lighter than comparable porcelain arrester.

• Directional Pressure relief vent system triggered by puncture plate.

• Arrester sealing verified by two high vacuum analytic leakage tests.
Constructed in 1978, the MOV block plant in Wadsworth, Ohio had a multimillion dollar expansion in 1986 and another in 1994. New technology for polymer-housed distribution arresters led to new equipment needs. Ohio Brass is committed to the industry and the requirement for only state-of-the-art innovation in the 4460 square meters MOV element plant. Emphasis on material development, process engineering, and process control coupled with a strong quality assurance program yield high quality, cost competitive MOV elements.

ROUTINE PRODUCTION TESTS
Ohio Brass maintains stringent testing controls in accordance with IEC 60099-4 to ensure that the customer receives consistent quality with every product. Ohio Brass performs various Quality Assurance tests on every batch of MOV blocks. The routine tests listed below, in addition to highly controlled manufacturing processes, ensure that Ohio Brass products demonstrate a superior level of quality.

MOV BLOCK ROUTINE TESTS:
• Physical Inspection – Visually performed post grind, post energy test, and for a final visual inspection.
• Rated Energy Test – Procedure confirms the energy capability of each zinc oxide disc element.
• Discharge Voltage Test – Every block undergoes full lightning discharge 8/20 current wave impulse to verify its volt vs. amp characteristics.
• Watts Loss Test – Test measures the AC watts loss and capacitive current characteristics of the disc.

MOV BLOCK BATCH QA TESTS:
• Square Wave Energy Test – Performed on a 5 block sample from each batch, this test is performed to quantify the batch energy capability.
• High Current Test – Each 5 block sample is subjected to two high current discharges of the same polarity to ensure high current characteristics.
• AC Life Test – The blocks are placed under test conditions for a minimum of 250 hours to verify performance.
Arrester assembly occurs in our modern 33,200 square meters plant in Aiken where the full line of MOV arresters are assembled and shipped. In addition to assembly operations, rubber injection molding of distribution arrester housings is also completed in Aiken. Ohio Brass’ quality assurance program is ISO 9001:2008 registered.

FACTORY QUALITY CHECKS AND ROUTINE TESTS
- Physical Inspection – Every molded rubber part, block, wrap module, bracket and completed unit is visually examined to reject defective products.
- Reference Voltage Test – Voltage is measured once a predetermined maximum peak current is reached.
- Partial Discharge Test – This test ensures that the partial discharge level of the arrester does not exceed a noise level of 10 pC.
- Residual Voltage Test – Determined by the sum of the 10 kA residual voltages or all MOV blocks in the unit. Sum of all units in the arrester are guaranteed not to exceed published values.
- Watts Loss @ Power Frequency Test Voltage– Changes the arrester under 60 Hz operating voltage to measure watts loss rate.
- Seal Leak Rate (with Helium) – This test is performed if the arrester housing/sealing type encloses internal air volume. Leak rate shall not exceed 1 x 10-7 Pa-m3/s per IEC. This Hubbell specification exceeds IEC 60099-4 standard by a factor of 10. The solder sealing of the unit is also checked for seal integrity by a second helium mass spectrometer test.

DEDICATED TO:
- Business Administration
- MOV Module construction
- Injection Molded Housings
- Arrester Manufacture/Assembly

Arrester Manufacturing Plant Built 1963 – (18,400 m2) Acquired by Hubbell 1971
Additional Expansion 1998 – (14,800 m2)
As pioneers in the electric utility industry market, we are one of the few suppliers with a comprehensive in house research and development lab. Hubbell Power Systems maintains fully equipped electrical and mechanical testing facilities in Wadsworth, Ohio, Centralia, Missouri, and Manchester, New Hampshire, with capability of performing virtually all of the industry (ANSI, IEC, CEA, etc.) tests required for all Hubbell products.

Wadsworth location houses four primary functional test areas (Power Lab, High Voltage Lab, Mechanical Lab and Multi-stress Environmental Test Facility). Each area is unique in the service it provides. The primary objective of this laboratory is to assist in the development of quality products for Ohio Brass and Hubbell Power Systems. Testing is the final step in the bridge between product design and implementation into production.

Centralia consists of short circuit, high voltage, heat run, and mechanical testing services. Environmental and instrumentation labs, outdoor high voltage test areas and auxiliary equipment such as high speed photography are also provided.

Manchester includes a mechanical, electrical, metallurgical, and environmental test areas. Each area has unique services that it provides. Areas include current cycle testing, short circuit and dielectric testing, mechanical testing such as tension, compression, and tensile, metallurgical testing to aid with material failure analysis, environmental testing such as salt fog, heat, and humidity chambers.
At the manufacturing facility in Aiken, South Carolina, quality starts with ensuring the raw material is correct and continues through to the finished product. Ohio Brass performs quality checks, packaging the finished product and tests throughout the assembly process. Process specifications empower all manufacturing personnel to consistently monitor all process operations. Building quality checks into our process ensures the long service life and reliability of our arresters. The Quality Assurance Department supports these self-inspecting practices by conducting random structured audits to further ensure compliance.

Each product undergoes routine electrical testing which includes residual voltage, internal partial discharge, reference voltage, power frequency, and seal leakage check. Arresters are inspected and tested according to IEC 60099-4 and ANSI/IEEE C62.11, ISO 9001, Quality Procedures, and Engineering Department Specifications for surge arresters.

Seal leak rate testing is completed to demonstrate the gas/water tightness of the arrester. The test is performed on each completed arrester unit. The IEC standard maximum seal leak rate is $1 \times 10^{-6}$ Pa.m$^3$/s or $9.87 \times 10^{-6}$ atm-cc/sec. We test to $1 \times 10^{-7}$ atm-cc/sec.

Every unit is assigned a unique serial number. The serial number can be utilized to trace the original test values and quality checks performed at the factory. The serial number is engraved on the name plate attached to the arrester as well as documented on the arrester shipping container.
About Hubbell Power Systems

Hubbell Power Systems (HPS) manufacturers a wide variety of transmission, distribution, substation, OEM and telecommunications products used by utilities. HPS products are also used in the civil construction, transportation, gas and water industries. Our product line includes construction and switching products, tools, insulators, arresters, pole line hardware, cable accessories, test equipment, transformer bushings and polymer precast enclosures and equipment pads.