

Casting Application **Focus**

PUMPS AND VALVES



INTRODUCTION



In pump and valve manufacture, the casting process plays an indispensable role as it lends itself readily to produce the very complex shapes of pump and valve components. When castings are made by the MEEHANITE process, the additional advantages of very close tolerances and consistent quality are obtained – important factors if the ever increasing demands of modern industry are to be met. The MEEHANITE range of materials permits selection of the appropriate grade of metal for each type of service and thus MEEHANITE castings offer the perfect

combination of economical manufacturing and a high standard of service performance. As a consequence, many important valve and pump manufacturers throughout the world use MEEHANITE castings in their products. A short survey of some of the many different applications in this particular field is provided in this brochure.

Among the materials specifically mentioned are the MEEHANITE flake graphite Types such as GD 35 – the MEEHANITE nodular (ductile) iron types, such as SP 80 and the

MEEHANITE austenitic nodular types, such as CRS 2. In addition, some of the heat resistant grades of MEEHANITE are used in such applications as hot gas valves and wear resistant grades of MEEHANITE are specified for sand and slurry pumps.

Fuller details of the specifications of the materials mentioned in this bulletin are available on request



PUMPS



MEEHANITE pump bodies are produced in a wide range of sizes. The castings shown opposite weigh between 2 lbs. and 120 lbs. and are produced in MEEHANITE Type GD 35 flake graphite iron. The MEEHANITE nodular types are available for applications calling for higher strength and toughness. Another application of MEEHANITE in this field is that of pump impeller wheels.

This pump housing is specified in corrosion resistant austenitic MEEHANITE Type CRS 2. The material contains a high percentage of nickel and is stabilized with niobium to facilitate welding. The total weight of the housing is 54,000 lbs. Typical service applications include the handling of sea and estuarine waters.



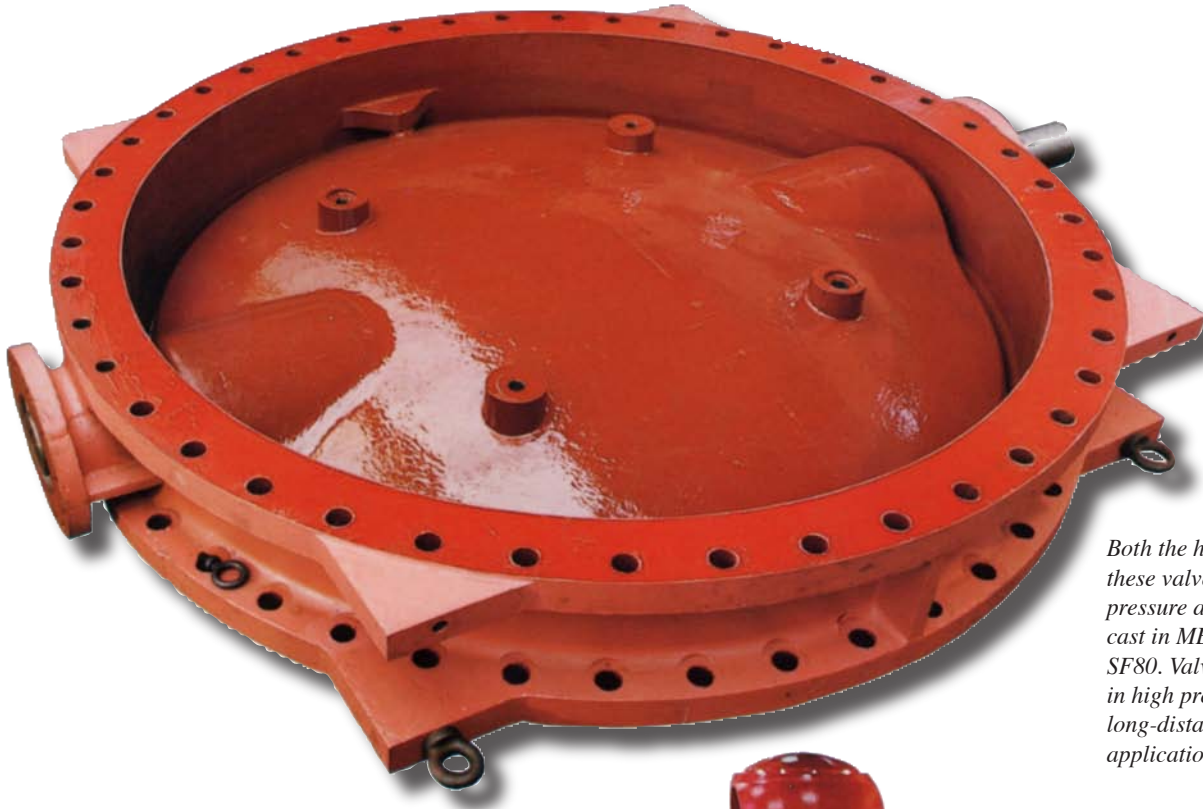
The two components making up a pump housing are the bottom portion (left) and the top portion (right), weighing 10,000 lbs. and 4,200 lbs. respectively. Again, the austenitic MEEHANITE Type CRS 2 was used to produce these castings.

VALVES

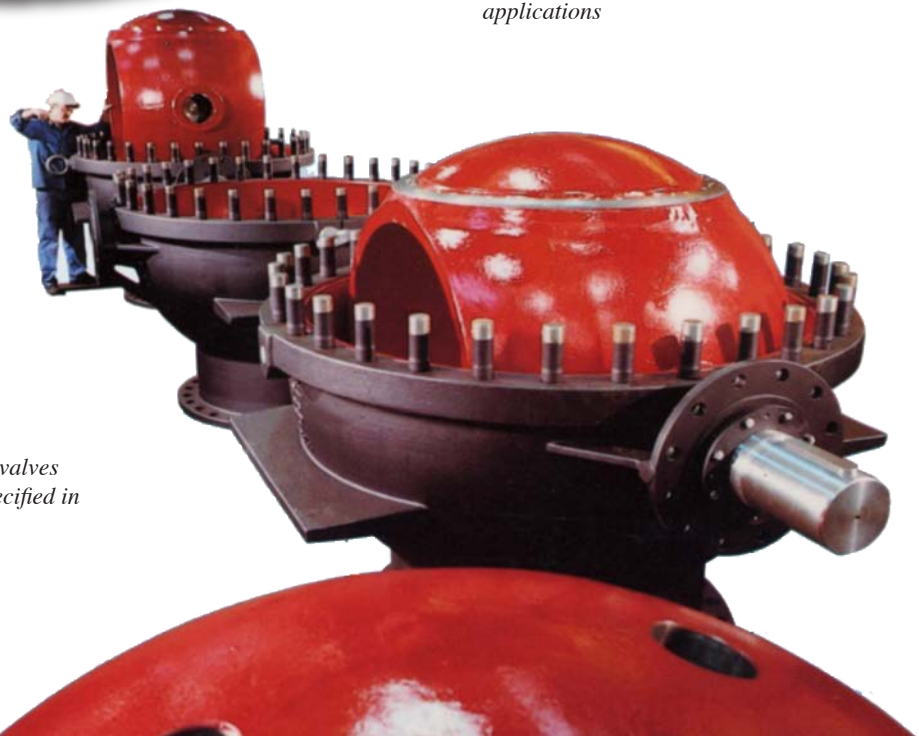


Valve components with proven service reliability over many years are produced both in MEEHANITE flake and nodular types, depending on rated pressure and valve size. The nodular iron types are particularly suitable for safety-critical parts and have replaced cast steel in many applications.

Both the housing and the plug of these valves, for 360 psi water pressure and with 40 inch bore, are cast in MEEHANITE nodular Type SF80. Valves of this kind are used in high pressure pumping stations long-distance pipelines and similar applications



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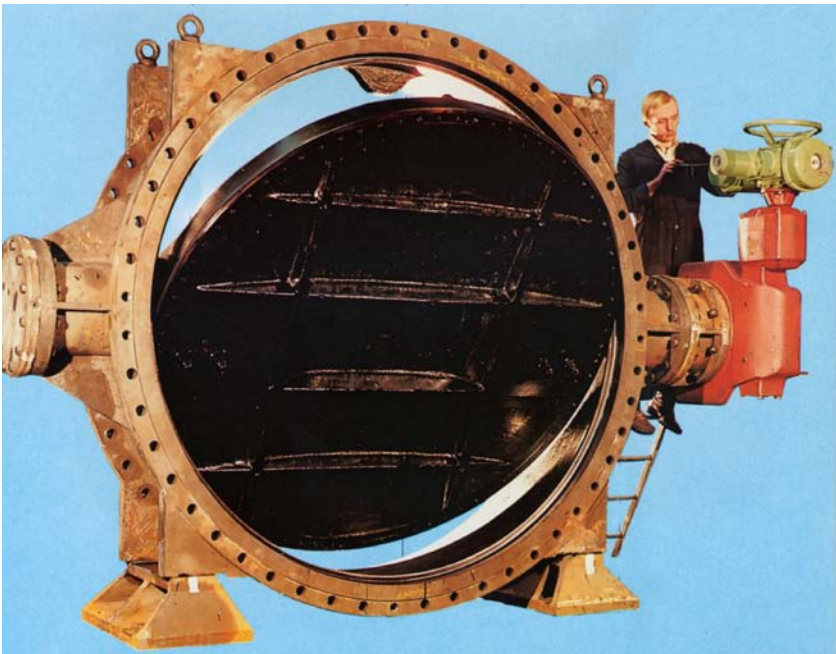


Both the body and the disc for these butterfly valves with a full bore diameter of 83 inches, are specified in MEEHANITE Type GD35

VALVES



Molds for large valve castings are generally produced from wooden patterns which are built with the utmost accuracy. Despite the size of this body pattern for an 86 inch bore butterfly valve, (shown below) which required nearly 175 cu.ft. of yellow pine, manufacturing tolerances were maintained within ± 0.03 inches.



This MEEHANITE butterfly valve of 86 inch bore diameter is a vital part of a dam project in Africa. It will operate as an isolating valve on reservoir draw-off duty in an irrigation and water supply scheme in Swaziland.

VALVES



Valves cast in MEEHANITE are used in many different fields ranging from municipal water and gas supply systems, to industrial plant and marine applications and are produced in practically any size from 1 inch to over 80 inch bores.

For these gate valve bodies, either MEEHANITE nodular iron or GE 35 can be used. The bore sizes are 1.6 and 6 inches while the castings weigh 20 and 77 lbs. respectively.

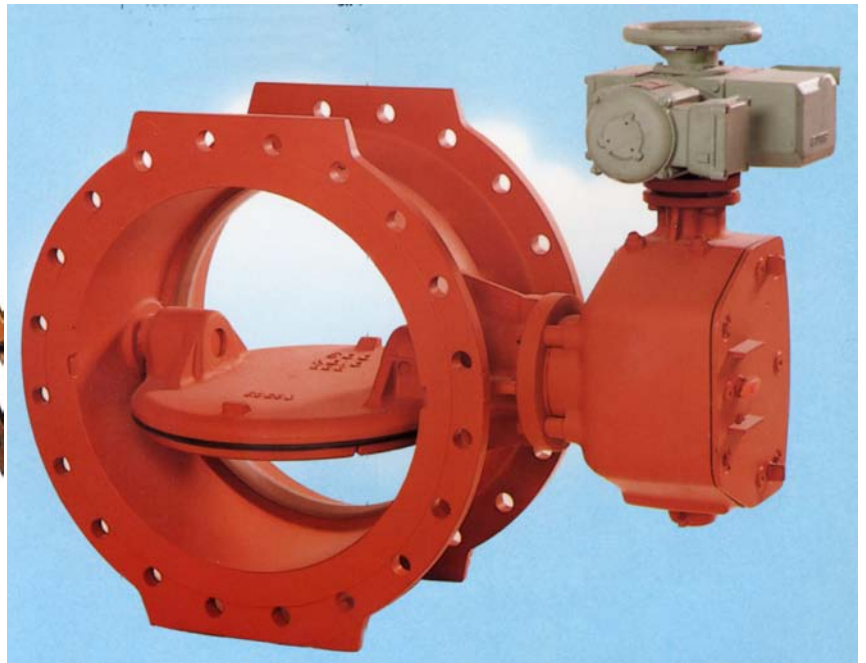
It is quite usual in the case of smaller valves, for the same pattern equipment to be used to produce castings in both flake and nodular graphite iron. This approach saves on pattern making costs.



Both the body and the disc of the 20 inch valve shown are MEEHANITE nodular iron castings for a rated pressure of 145 psi. The actuator housing is cast in MEEHANITE Type GD 35



The body of this large wedge gate Valve, shown being assembled, is cast in MEEHANITE Type GD 35 and weighs over 9 tons. It features metallic sealing seat faces and a bore of 72 inch diameter. The valve has been installed for isolating duties in the cooling water circuit of a British nuclear power station.



COATINGS



The normal engineering types of MEEHANITE are inherently resistant to attack from a wide range of the media handled by pumps and valves. The austenitic CR and CRS types exhibit much greater corrosion resistance, and are used where the particular service conditions justify the rather higher manufacturing costs.

Another route to combine economy with resistance against chemical and/or mechanical attack is the use of protective coatings on castings made in the standard MEEHANITE grades. To obtain a coherent bond between the various coatings and the casting, the surface integrity of the casting is of the greatest importance and the MEEHANITE process is the ideal way of ensuring this.

A very wide range of protective linings and coatings is now available, from electroplating and hard facing to glass and vitreous enamel, rubbers and plastics, to complex synthetic resin paint systems. Only a few examples are illustrated.



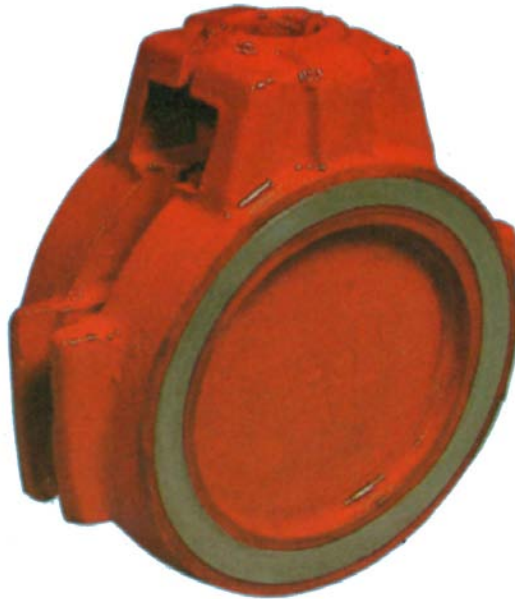
Various types of rubber coating are available for handling corrosive and abrasive media for low additional outlay



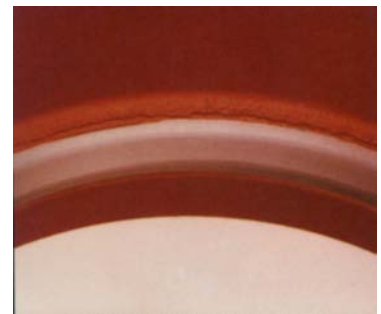
Borosilicate glass coatings offer purity and smooth flow characteristics together with great strength and resistance to chemical attack



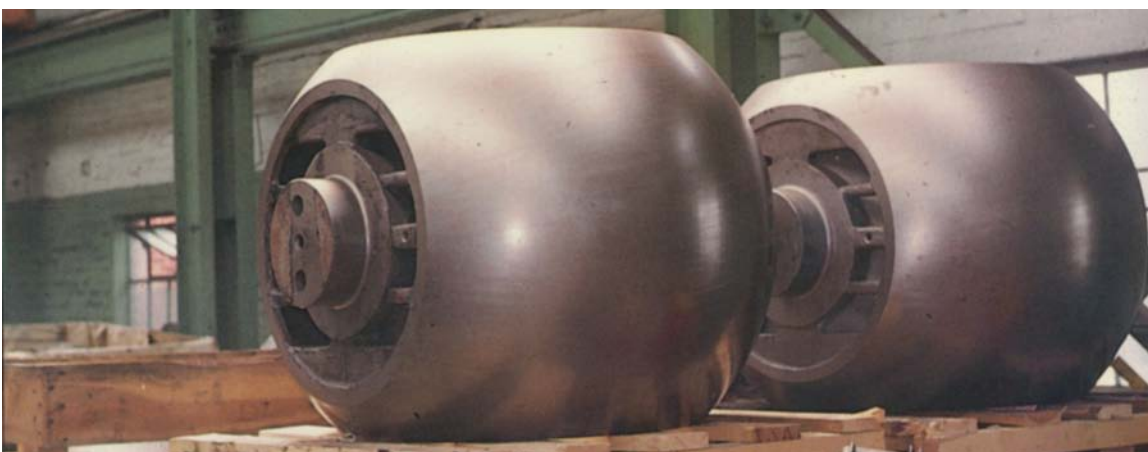
Polypropylene linings provide both abrasion and corrosion resistance for long service on chemical processing, water treatment and effluent handling.



The seating face of this valve gate features a stainless nickel-chromium weld overlay for use in extreme service conditions in water handling, industrial, and chemical applications



The super finished nickel weld overlay on the body seating face of a butterfly valve ensures a safe seal and long life when performing in combination with a resilient sealing ring on the disc



The ball valve plugs for a 56 inch gas pipeline have been electroplated with nickel followed by hard chrome so as to ensure long trouble-free service life under the most extreme conditions.