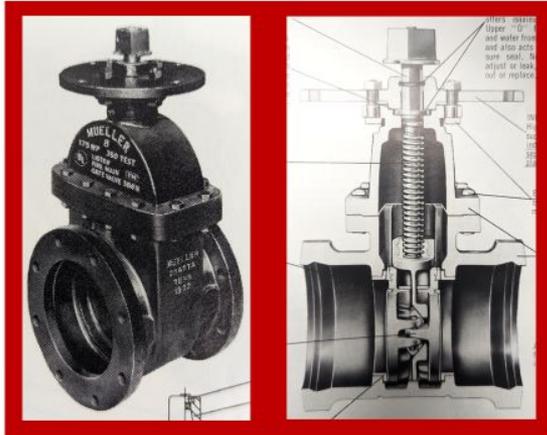


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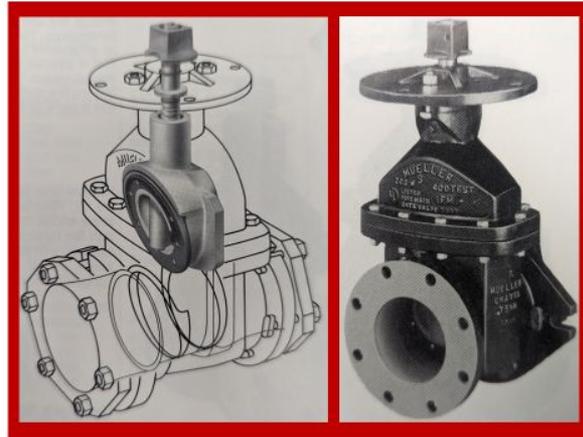
**SHUTOFF
VALVES**



Evolution of Resilient Wedge



1905 - Double Disc Gate Valve
(C500)
2000 - Stopped 2"-12" DDGV



1978-1997 - Resilient Seat
Uni-Directional



1993 - Resilient Wedge
(Cast Iron, Thick Wall, Flat
Gasket, C509)

Evolution of Resilient Wedge



- 2014 – Next Gen Resilient Wedge
- Ductile Iron Thin Wall (C515)
- Up-rated 350 psi
- Lower Sealing Torque

RESILIENT SEAT / RESILIENT WEDGE GATE VALVE

The Basics

- Used in clean water applications
- Either fully open or fully closed
- Minimal pressure loss as gate/wedge is fully removed from the flow path
- Types:
 - Rising Stem (OS&Y)
 - Non-rising Stem



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RESILIENT SEAT / RESILIENT WEDGE GATE VALVE

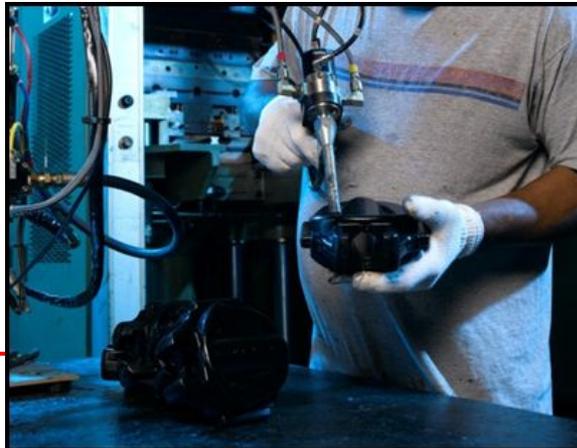
- UL listed / FM approved up to 12" with 350 psi maximum working pressure.
- Bi-directional flow
- Stem is interchangeable with installed 2360 valves and available in the following materials:
 - Manganese Bronze
 - Everdur
 - 304 or 316 Stainless Steel



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RESILIENT SEAT / RESILIENT WEDGE GATE VALVE

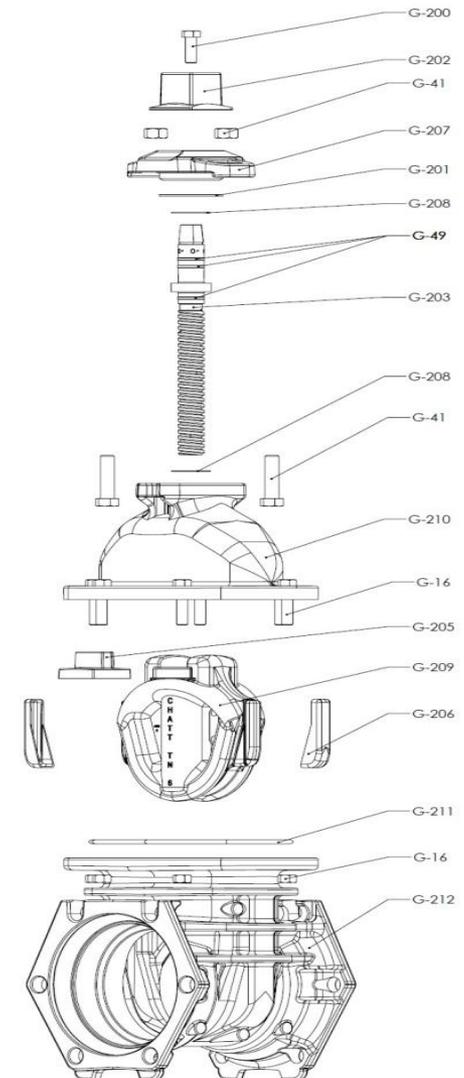
- New fully encapsulated Ductile Iron wedge design allows for 350psi rating.
- Polymer guide caps.
- New wedge interchangeable with installed 2360 valves.
- SBR elastomer as standard, EPDM option.



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NGV EXPLODED VIEW – BRONZE STEM

Component	Component Name	Material of Construction
G-200	Cap Screw	304 Stainless Steel
G-202	Wrench Nut	Ductile Iron ASTM A536
G-41	Stuffing Box Nut	304 Stainless Steel
G-207	Stuffing Box	Ductile Iron ASTM A536
G-201	Stuffing Box Seal	Nitrile Rubber
G-208	Anti-Friction Washer	Acetyl
G-49	Stem O-ring	Nitrile Rubber
G-203	Stem	See Note 1*
G-41	Stuffing Box Bolt	304 Stainless Steel
G-210	Bonnet	Ductile Iron ASTM A536
G-16	Bonnet Bolt	304 Stainless Steel
G-205	Stem Nut	Bronze B62
G-209	Encapsulated Disc	See Note 2*
G-206	Guide Cap	Acetyl
G-211	Bonnet O-ring	Nitrile Rubber
G-16	Bonnet Nut	304 Stainless Steel
G-212	Body	Ductile Iron ASTM A536



CHATTANOOGA, TENNESSEE



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RESILIENT WEDGE PRESSURE TESTS

- Pressure test every valve at 350 psi in addition to every tenth valve at 50 psi
- Shell test every valve at 700 psi
- UL listed / FM approved at 350 psi



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GATE VALVE ADVANTAGES

1. Low Head Loss
2. Ease of repair
3. Bi-Directional
4. Initial Investment for 12" and smaller
5. Higher Pressure ratings

GATE VALVE DISADVANTAGES

1. Cannot be used for Flow Control
2. Weight and Size
3. Limited Gearing Options
4. Initial Investment for 14" and larger

MUELLER AND PRATT BUTTERFLY VALVES

The Basics

- Used in clean water applications
- Can be used for throttling
- Bi-Directional
- Minimal pressure loss in full open position
- Types:
 - Seat on Body
 - Seat on Disc

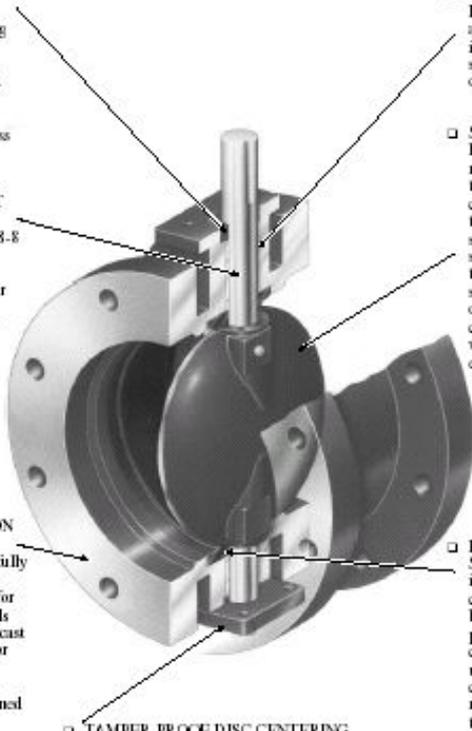


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BUTTERFLY VALVES COMPONENTS

MUELLER LINESEAL III Butterfly Valve Features

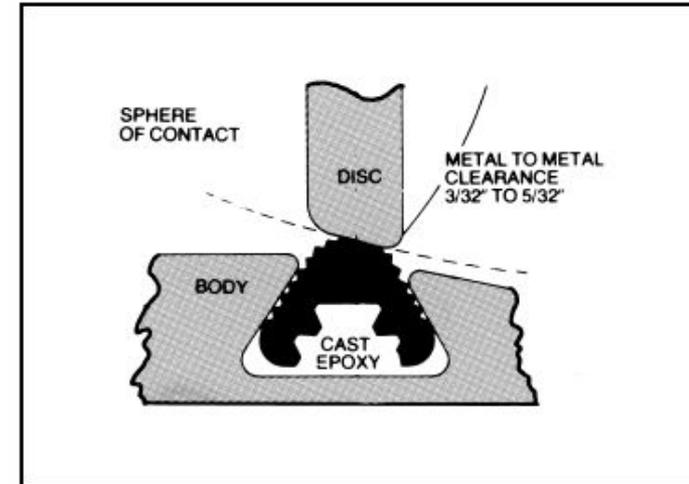
- ❑ **CHEVRON V-TYPE PACKING**— is self-adjusting, long lasting and should never need replacement because quarter-turn valve operation causes little or no wear. Packing bears on turned ground and polished stainless steel.
- ❑ **CORROSION RESISTANT SHAFT**— is constructed of type 304, 18-8 stainless steel. Shaft is one-piece, through-shaft construction sized to meet or exceed requirements of AWWA Standard C504 for Class 150B service.
- ❑ **HEAVY DUTY CAST IRON BODY**— is extra heavy with flanges fully faced and drilled per ANSI B16.1 Class 125 Standard for cast-iron flanges. Other ends available include integrally cast mechanical joint, slip-on (for DI and PVC C900), and grooved style. Operator mounting trunnion is machined and drilled for four-bolt connection.
- ❑ **TAMPER-PROOF DISC CENTERING**— provided by precision molded flats in the bonded seat at the body trunnion mate with machined flats on the disc to provide tamperproof centering of the disc in the body. Positive disc alignment, without play, assures long seat life.
- ❑ **SELF-LUBRICATING BEARINGS**— are liberally sized, chemically inert nylon bearings that are self-lubricating and should outlast the life of the pipeline.
- ❑ **STREAMLINED DISC**— has lens-shaped design to minimize pressure drop and turbulence. Full open valve creates no more friction loss than a 45° elbow. Disc is secured to the shaft by stainless steel pins sized to transmit torques required and withstand stresses imposed under severe operating conditions. Disc is cast iron ASTM A-126 Class B with 316 stainless steel disc edge.
- ❑ **ELASTOMERIC BODY SEAT**— is made of a special rubber compound (Buna N) that is bonded to the body by a patented process. The seat cannot be torn from the body under normal pipeline conditions. The precision molding process also ensures that the disc-seat indentation cannot cause excessive wear or abrasion upon closing.



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SEAT ON BODY BUTTERFLY VALVES

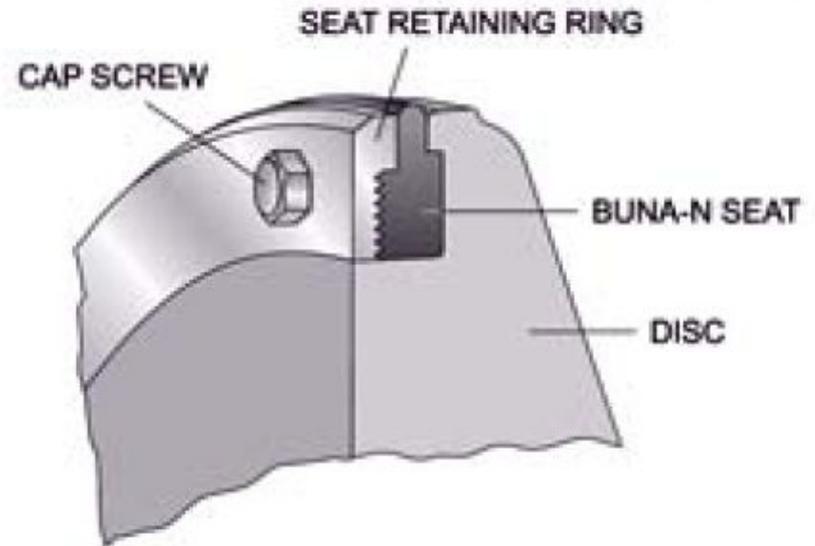
- Resilient Seat of Valve is located in a recessed cavity
- Epoxy is injected behind the seat to ensure zero leakage
- Disc has Stainless Steel edge for seating
- Disc can “sweep” away any tuberculation each time the valve is exercised



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SEAT ON DISC BUTTERFLY VALVES

- Resilient Seat is mounted with Stainless Steel hardware to the disc
- Stainless Steel ring is rolled onto the body with o-rings behind
- Field replaceable



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SEAT ON DISC VS SEAT ON BODY

- Field replaceable for Seat on Disc
- Protection of the seat is most important to ensure positive sealing
 - Seat can be damage by any buildup in the pipe (top right)
 - Seat can be worn over time high velocity flow (bottom right)
 - Cavitation can damage either seat if throttling outside of acceptable range

Pratt – Rubber Seat on Body Designs

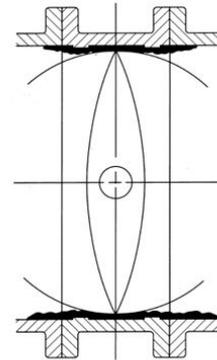


FIGURE 1

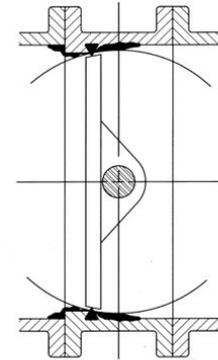


FIGURE 2

Rubber Seat on Disc Design by Others

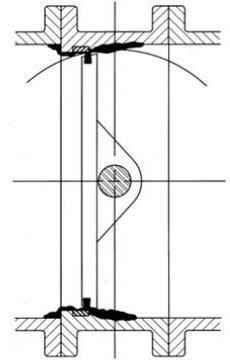
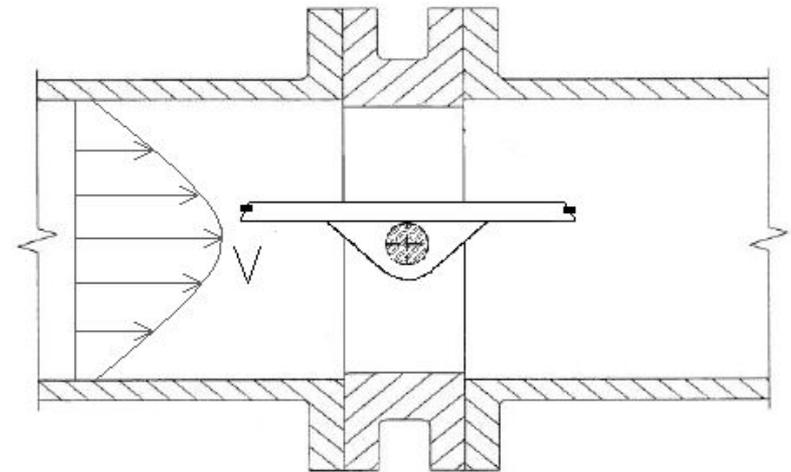


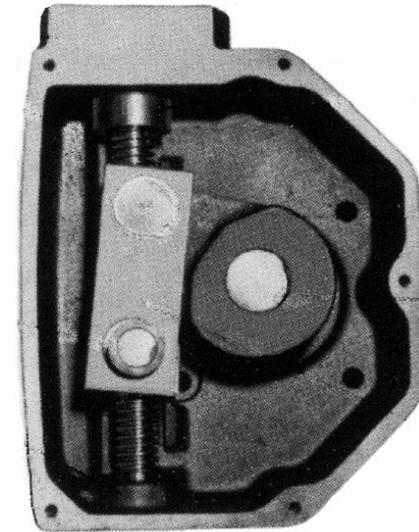
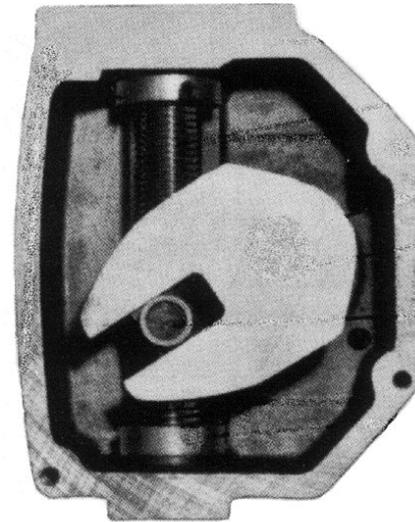
FIGURE 3



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BUTTERFLY VALVE ACTUATORS

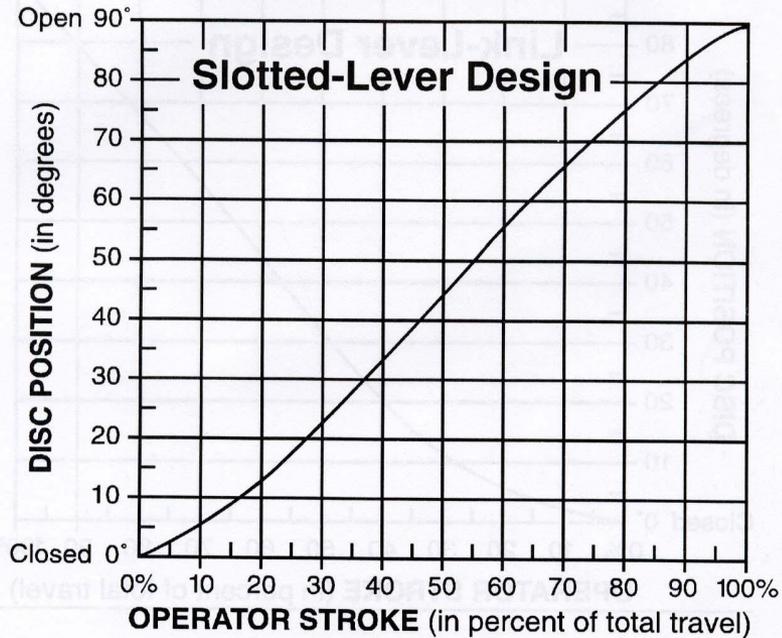
- Butterfly Valves are typically operated by traveling nut actuators
- Slower opening and closing to prevent water hammer
- Worm Gears
- Electric Actuators
- Cylinder-Operated
 - Pneumatic
 - Hydraulic



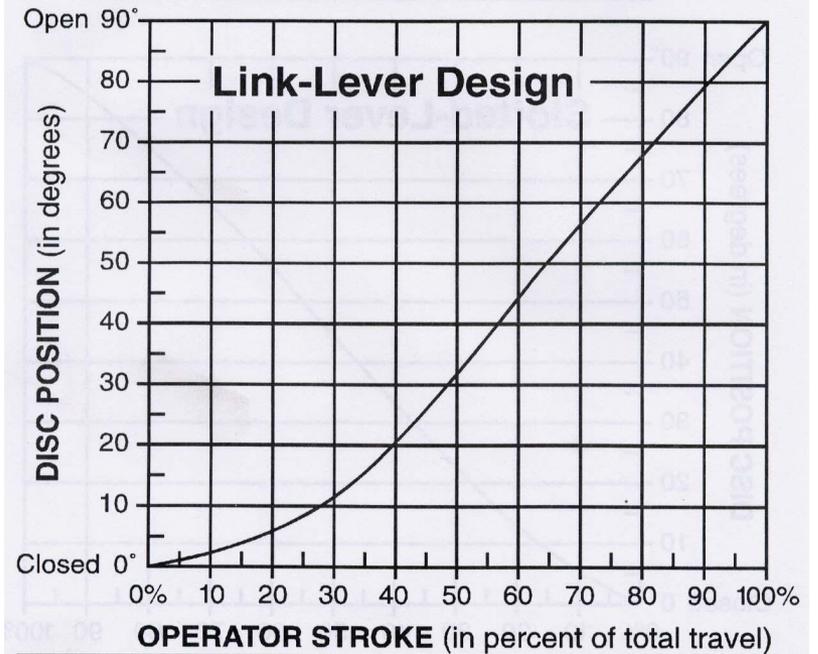
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BUTTERFLY VALVE ACTUATION

MDT ACTUATORS FOR 4"-12" BUTTERFLY VALVES



MDT ACTUATORS FOR 14" AND LARGER BUTTERFLY VALVES



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THEY MAKE 'EM BIG



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BUTTERFLY VALVE ADVANTAGES

1. Size and Weight
2. Bi-Directional
3. Initial Investment for 14" and larger
4. Actuation Options

BUTTERFLY VALVE DISADVANTAGES

1. Higher Head Loss and Cannot be Piggged
2. A Damaged Seat will leak
3. Initial Investment for 12" and smaller
4. Pressure Ratings

CONCLUSION

Gate Valves

- Preferred when flow control is not necessary
- Higher Pressure Ratings
- Can be repaired without unbolting body from pipeline
- Lower operating Costs (no obstructions) and initial investment for 12" and smaller

Butterfly Valves

- Required when throttling flow is needed
- Might be only option for larger size range due to space requirements
- Actuation options
- Typically Specified for 12" or 16" and larger

QUESTIONS

QUESTIONS?

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Check Valves



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WHAT IS A CHECK VALVE?

- **A check valve allows flow in one direction and automatically prevents back flow (reverse flow) when fluid in the line reverses direction. They are one of the few self-automated valves that do not require assistance to open and close.**
- **Types of Check Valves**
 - Swing Check Valve
 - Dual Disc Check Valve
 - Silent Check Valve
 - Rubber Flapper Check Valve
 - Tilted Disk Check Valve

HOW THEY LOOK



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- **Potable Water vs. Wastewater**
- **High Pressure Situations**
- **Fire Service**

- **Keys in Selecting Check Valve**
 - Headloss
 - Fast vs. Slow Acting
 - Price
 - Lay Length
 - Media

KEYS TO SELECTING CHECK VALVE

- **Headloss**
 - This can affect operating costs as well as affect ability to “pig”
- **Media**
 - Suspended Solids can affect Check Valve Functionality
- **Fast vs. Slow Closing**
 - Used to prevent Water hammer in pipeline and protect pumps
- **Price**
 - Initial Price investment may be cost prohibitive
- **Lay Length**
 - Some applications require wafer style with limited offerings