Evolution of Fire Hydrants and Valves

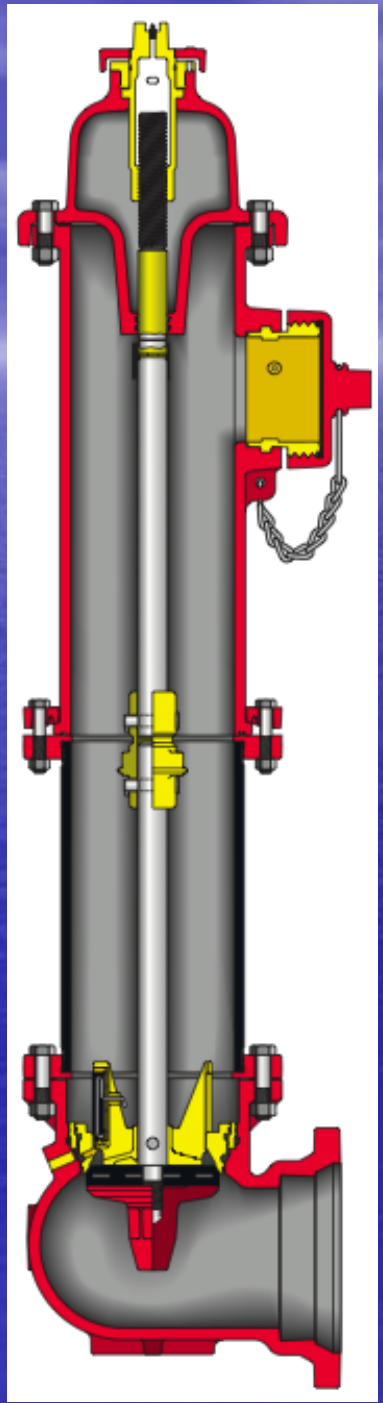
Ryan Bordinger- With Kennedy Valve

Kennedy Valve

- Plant History: In 1877 Daniel Kennedy started making gate valves in a little shop in lower Manhattan, New York City. The operation was successful and the plant moved to Coxsackie, New York in 1890 where it became known as the Kennedy Valve Manufacturing Company. In 1907 the operation moved to Elmira, New York. During World War I, the plant made shell casings. During World War II the plant made valves for the Victory Fleet Program and various parts for aircraft carriers and landing craft.
- The plant on the Eastern approach to the city of Elmira has expanded several times. In 1920 a brass foundry was built. In 1950 an enlarged foundry and machine and shipping area were added. A warehouse was added in 1963. New offices were completed in 1972 and a major foundry modernization project was completed in 1980.

- In 1962, the Grinnell Corporation of Providence, Rhode Island purchased Kennedy Valve Manufacturing Company.
- In 1963 the Kennedy Valve Manufacturing Company purchased the Mathews hydrant from the R.D. Wood Manufacturing Company.
- 1969 the Grinnell Corporation was purchased by ITT and Kennedy Valve became a wholly owned subsidiary of ITT Grinnell.
- 1985 ITT sold the Grinnell Corporation but retained Kennedy Valve as part of ITT Fluid Technology.
- In 1988, McWane Inc. of Birmingham, Alabama purchased Kennedy Valve.
- The plant manufactures fire hydrants, gate valves, butterfly valves, gruvlok valves and check valves for municipal water systems. UL and FM approve a number of these products for use in fire suppression and sprinkler systems.

Movie for Kennedy how its made



Lean manufacturing

Beginning the Lean Journey

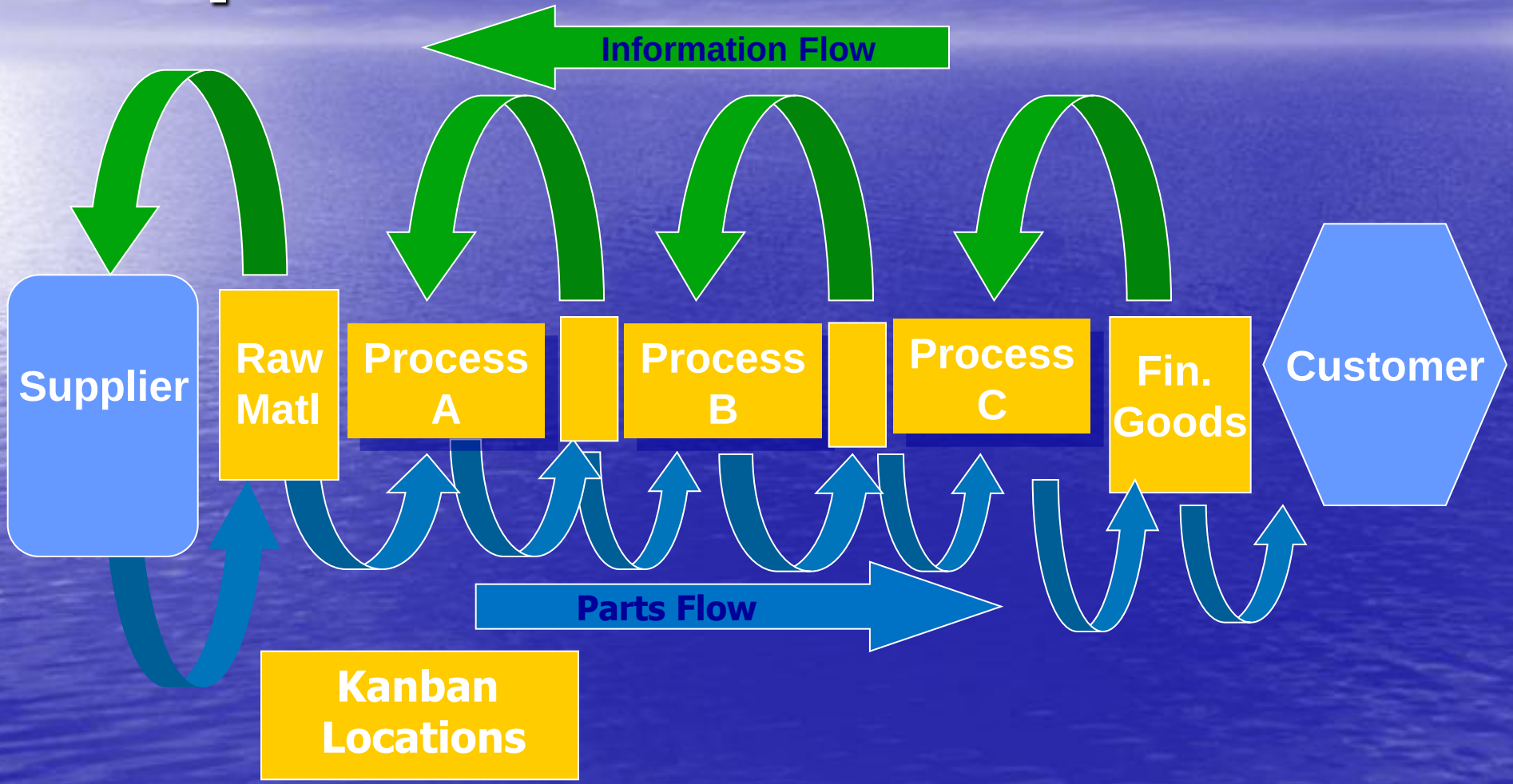
How to begin:

- Level load the production to minimize the effect of seasonality on Operations and Supply Chain
- Organize the operation into value streams
  - Physically move resources in sequence with processes – minimizes waste of motion
  - Manage the steps that create value for products within the value stream as independent business
  - Dedicate resources exclusively to the value stream

Creating Pull and Replenishment

- Set raw material, WIP and FG inventory levels and replenishment triggers to create visual pull systems
  - Pull and flow systems trigger production and prevent stock-outs.
    - Improve delivery and lead time without risk of carrying more inventory than necessary.

Continuous Flow & Replenishment

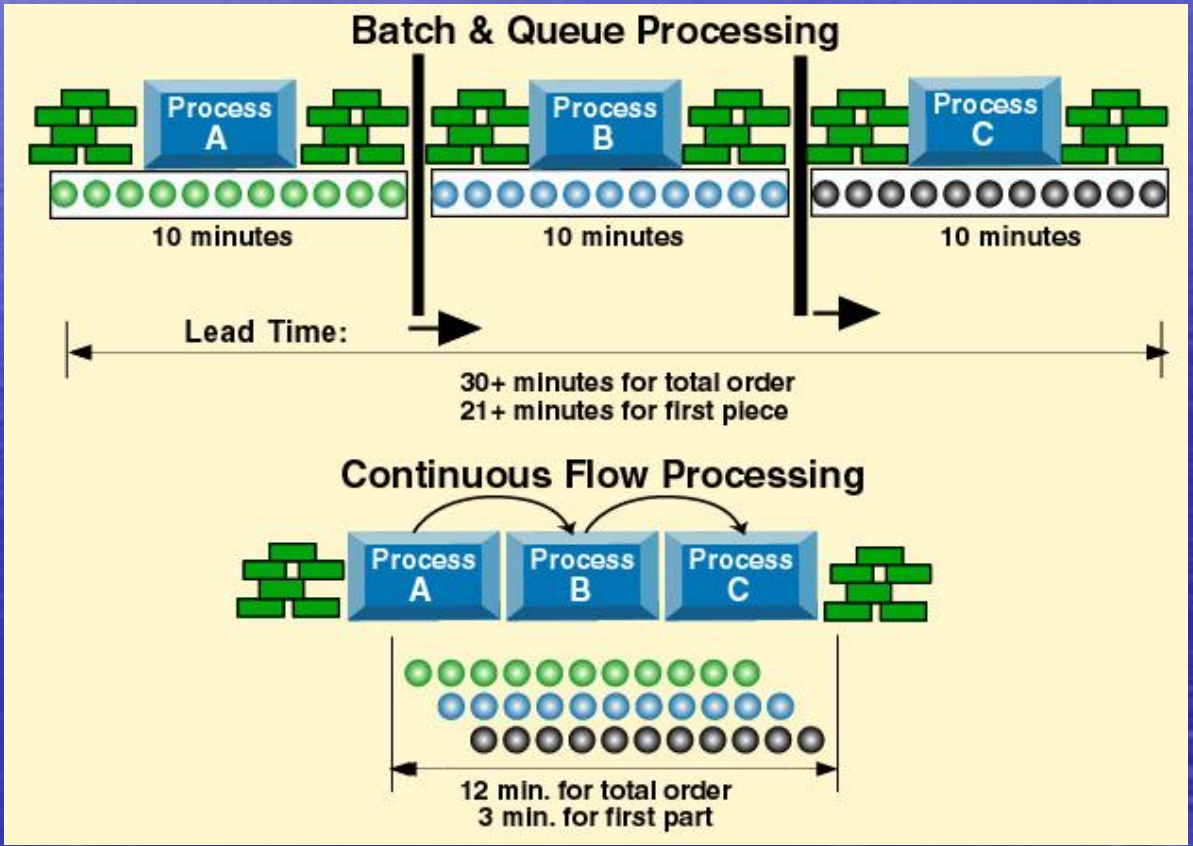


Reduce Batch Size

- Minimize lead time by reducing batch size and creating continuous flow

Old way of manufacturing = 21 minutes to get the first piece finished

Current method = 3 minutes to get the first piece finished



Supply Chain Partners

- Develop partnerships in the supply chain for smaller, more frequent delivery of raw material and components
  - Improve responsiveness to non-stock items by reducing lead time for components and shortening the time between paying for materials and shipping finished product.
  - Working together to find solutions to challenges with quality, cost and delivery

Production Partners

- Create an engaged culture of continual improvement.
  - Empower all employees to identify waste in all its forms and work together to create improvements
    - SAFETY
    - QUALITY
    - COST
    - DELIVERY

Compare Before and After Beginning Lean

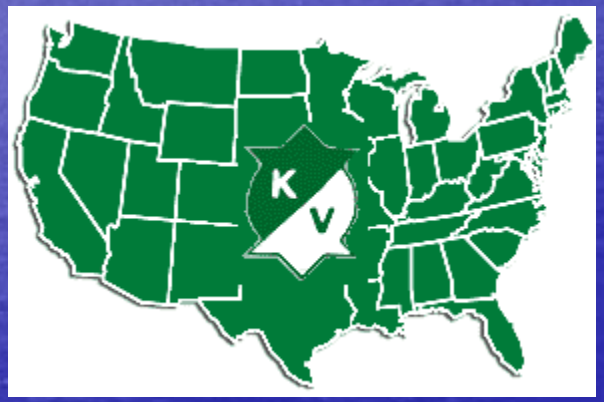
	CURRENT STATE	FUTURE STATE
Total Lead Time	290 days	59 days
Raw Material	181 days	45 days
WIP	109 days	14 days
Finished Goods	22 days	7 days
Process Time	150 min	145 min
OTD	79%	98%
LT to Customer	32 days	10 days

The improvement journey continues and never ends

Benefits to Thinking Lean

- Reduced lead time
- Responsiveness
- On Time Delivery
- Quality to the customer, and within WIP
- Improve employee morale and pride
  - Actively partners in improvement activity
  - Safer and cleaner work environment
  - Positive outlook about the future

History and Maintenance of Today's Fire Hydrants and Valves



Ryan Bordinger

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History of Fire Hydrants

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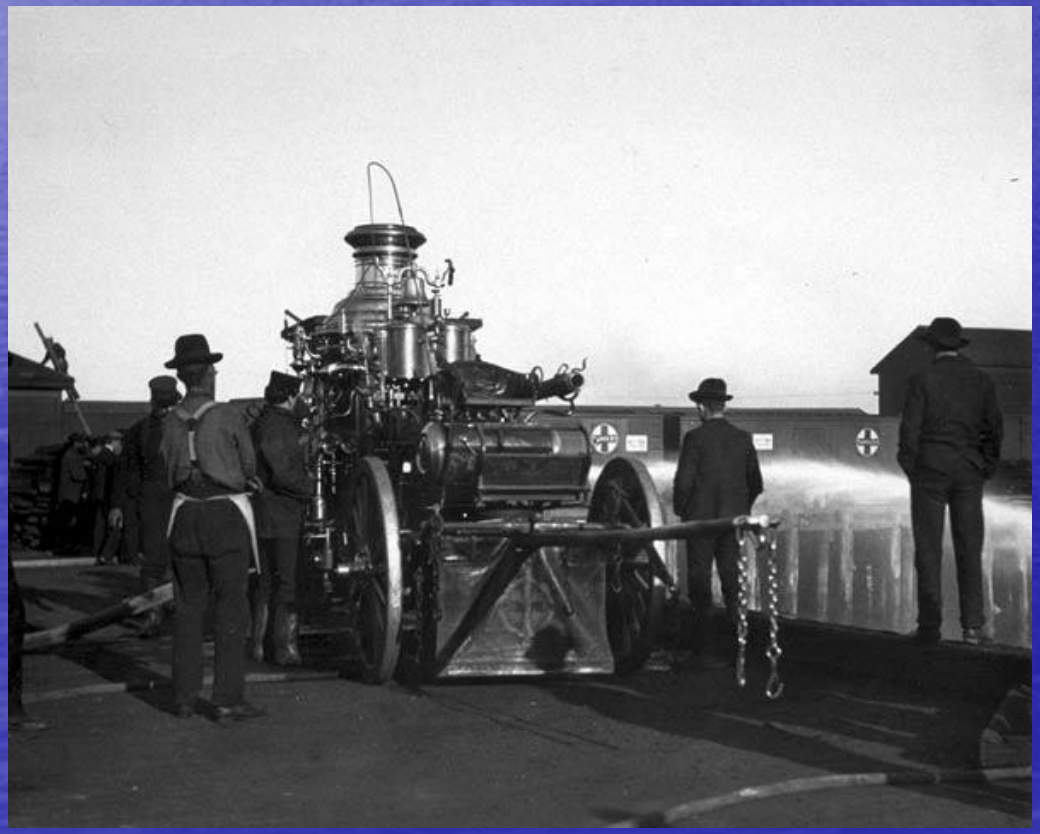
- Bucket Brigades
- Hand Pumped Fire Engines

History of Fire Hydrants

- Hand Pumped Fire Engines



History of Fire Hydrants

- 19th Century Hydrants

Plueger & Henger

(St. Louis)

Boston Machine Mfg. Co.

Gilbert Hunt Co.

(Walla Walla, WA)

R.D. Wood Co.

(Philadelphia)

Uses of Fire Hydrants

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Types of Fire Hydrants

- Dry Barrel Hydrants
- Wet Barrel Hydrants
- Flush Hydrants
- Post Hydrants
- Dry Hydrants

Dry Barrel Hydrants

- Introduced in 1875
- Conforms fully with AWWA C502

Dry Barrel Hydrants

Kennedy K81-D

Dry Barrel Hydrants

AFC Darling B84B

Dry Barrel Hydrants

AFC Waterous WB67-250 Pacer

Dry Barrel Hydrants

U.S. Pipe Met 250

Dry Barrel Hydrants

M&H 929 “Reliant”

CLOW

WET BARREL FIRE HYDRANTS

THE ONLY COMPLETE LINE IN THE INDUSTRY...
CAST IRON AND BRONZE HYDRANTS MEETING
AWWA C503 SPECIFICATIONS

CLOW VALVE CO.
1375 Magnolia Avenue
Corona, California 91719
Phone 909-735-5555
FAX 909-735-0837
1-888-889-2411

CLOW
VALVE COMPANY
A Division of McWane, Incorporated

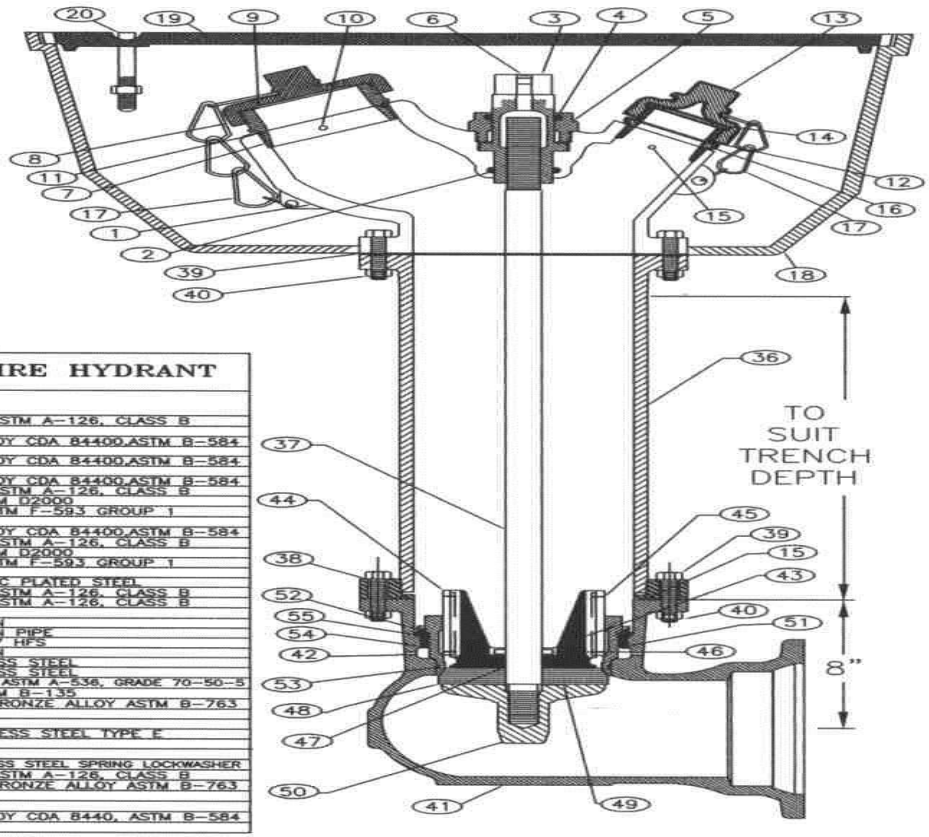
CLOW VALVE CO.
902 South 2nd Street
Oskaloosa, Iowa 52577
Phone 515-673-8611
FAX 515-673-8269
http://clowvalve.com

Wet Barrel Hydrants

Jones J3700 Model

Flush Hydrants

M&H Flush Type Hydrants are for use where traffic model hydrants protruding above ground might interfere with traffic in such places as airport runways and industrial areas. May be set in vaults or can be supplied with cast iron box and cover. This flush type hydrant sits completely underground and is accessible by simply lifting the box cover. Internal parts of the hydrant are exactly the same as the M&H 129 hydrant.



M&H MODEL 229 "FLUSH TYPE" FIRE HYDRANT

ITEM#	QTY	DESCRIPTION	MATERIAL
1	1	NOZZLE SECTION	CAST IRON ASTM A-126, CLASS B
2	1	OP NUT O-RING SEAL	RUBBER
3	1	OPERATING NUT	BRONZE ALLOY CDA 84400,ASTM B-584
4	1	HOLD DOWN NUT "O" RING	N.B.R.
5	1	HOLD DOWN NUT	BRONZE ALLOY CDA 84400,ASTM B-584
6	1	LUBRICATING PLUG	BRONZE
7	1	PUMPER NOZZLE 4 1/2	BRONZE ALLOY CDA 84400,ASTM B-584
8	1	PUMPER NOZZLE CAP	CAST IRON ASTM A-126, CLASS B
9	1	PUMPER NOZZLE CAP GASKET	RUBBER ASTM D2000
10	1	PUMPER NOZZLE SET SCREW	18-8 SS ASTM F-593 GROUP 1
11	1	PUMPER NOZZLE "O" RING	N.B.R.
12	2	HOSE NOZZLE 2 1/2	BRONZE ALLOY CDA 84400,ASTM B-584
13	2	HOSE NOZZLE CAP	CAST IRON ASTM A-126, CLASS B
14	2	HOSE NOZZLE CAP GASKET	RUBBER ASTM D2000
15	2	HOSE NOZZLE SET SCREW	18-8 SS ASTM F-593 GROUP 1
16	2	HOSE NOZZLE "O" RING	N.B.R.
17	–	NOZZLE CAP CHAINS	ELECTRO ZINC PLATED STEEL
18	1	HYDRANT BOX	CAST IRON ASTM A-126, CLASS B
19	1	HYDRANT BOX COVER	CAST IRON ASTM A-126, CLASS B
20	1	HYDRANT BOX COVER HANDLE	STEEL
36	*1	STAND PIPE UPPER FLANGE	DUCTILE IRON
37	1	STAND PIPE	DUCTILE IRON PIPE
38	1	MAIN VALVE ROD	STEEL C1117 HFS
39	*1	STAND PIPE LOWER FLANGE	DUCTILE IRON
40	16	SHOE/NOZZLE BOLTS 5/8-11 X 3 1/2	304 STAINLESS STEEL
41	16	SHOE/NOZZLE NUTS 5/8-11	304 STAINLESS STEEL
42	1	HYDRANT SHOE/ELBOW	DUCTILE IRON ASTM A-536, GRADE 70-50-5
43	2	DRAIN HOLE BUSHINGS	BRONZE ASTM B-135
44	1	UPPER DRAIN VALVE/UPPER VALVE PLATE	ALUMINUM-BRONZE ALLOY ASTM B-763
45	2	DRAIN VALVE FACINGS	BUNA "N"
46	8	DRAIN VALVE FACING RIVETS	COPPER
47	1	LOWER STEM PIN 1/2" X 1 3/4	18-8 STAINLESS STEEL TYPE E
48	2	LOWER STEM "O" RING SEAL	N.B.R.
49	1	MAIN VALVE RUBBER/SEAT	S.B.R.
50	1	LOWER VALVE PLATE LOCKWASHER	18-8 STAINLESS STEEL SPRING LOCKWASHER
51	1	LOWER VALVE PLATE/BOTTOM PLATE	CAST IRON ASTM A-126, CLASS B
52	1	BRONZE MAIN VALVE SEAT RING	ALUMINUM-BRONZE ALLOY ASTM B-763
53	1	MAIN VALVE SEAT RING UPPER "O" RING	N.B.R.
54	*1	MAIN VALVE SEAT RING LOWER "O" RING	N.B.R.
55	*1	SHOE RETAINER RING	BRONZE ALLOY CDA 8440, ASTM B-584
		SHOE RETAINER RING "O"-RING	N.B.R.

* NOT FIELD REPLACEABLE – PERMANENTLY INSTALLED

MAIN VALVE SIZES AVAILABLE: 5 1/4"

150 PSI WORKING PRESSURE
300 PSI HYDROSTATIC TEST PRESSURE

HYDRANT SHOE STYLES AVAILABLE:
6" – MECHANICAL JOINT
6" – FLANGED

M&H VALVE COMPANY
ANNISTON, ALABAMA
A DIVISION OF MCWANE INC.

DWN: TRIJ
DATE: 7/1/05
DWG. NO. FH-229

Post Hydrants

- Special Purpose Hydrant for Use Where Firefighting is Not the Primary Function
- Smaller in Size than AWWA Standard
- MVO Size Usually 2 ½”
- Most Often for Wash Down Service at Treatment Plants
- Other Uses: Flush or Bleed Air Pockets, or Fill Tanks in Non-Emergency Service

Post Hydrants

Dry Hydrants

Installation Suggestions

- Adopt a Flow Color Scheme
  - >1500 GPM — Light Blue
  - 1000-1500 GPM — Green
  - 500-999 GPM — Orange
  - <500 GPM — Red

Common Errors With Fire Hydrants

Extension Needed

Common Errors With Fire Hydrants

Hydrants Buried Too Low May Not Break-Off Correctly if Struck

Common Errors With Fire Hydrants

Hydrants Buried Too High May Not Break-Off Correctly if Struck

Troubleshooting

- Hydrant Leaks Past Seat (Most Common)
- Hydrant Spins Freely When Operated
- Hydrant is Hard to Open
- Hydrant Didn't Break off Properly
- Hydrant Leaks at One of the Flanges
- Hydrant Chatters When Operated
- Ground around hydrant is saturated with water

Troubleshooting

- Hydrant Leaks Past Seat

Troubleshooting

- Hydrant Spins Freely When Operated

- Break Coupling is Broken
- Stem is Broken

Troubleshooting

- Hydrant is Hard to Open

- Grease/Oil is Needed
- Stem is Bent
- Drain facings are damaged

Troubleshooting

- Hydrant Didn't Break off Properly

Troubleshooting

- Hydrant Didn't Break off Properly

- Hydrant not Installed Properly
- Wrong Coupling Installed at Ground Line
- Inadequate Soil Conditions

Troubleshooting

- Hydrant Leaks at One of the Flanges

- Nuts & Bolts are Loose
- O-ring/Gasket is Damaged or Missing
- Break Kit/Extension Installed That Isn't From Manufacturer

Troubleshooting

- Hydrant Chatters When Operated

- Break Kit/Extension Installed That Isn't From Manufacturer
- Drain Facings are Damaged
- Incorrect Length of Stem
- Multiple Extensions are Installed

Troubleshooting

- Ground around hydrant is saturated with water

- Hydrant isn't off all the way
- Debris Stuck in Main Valve Rubber

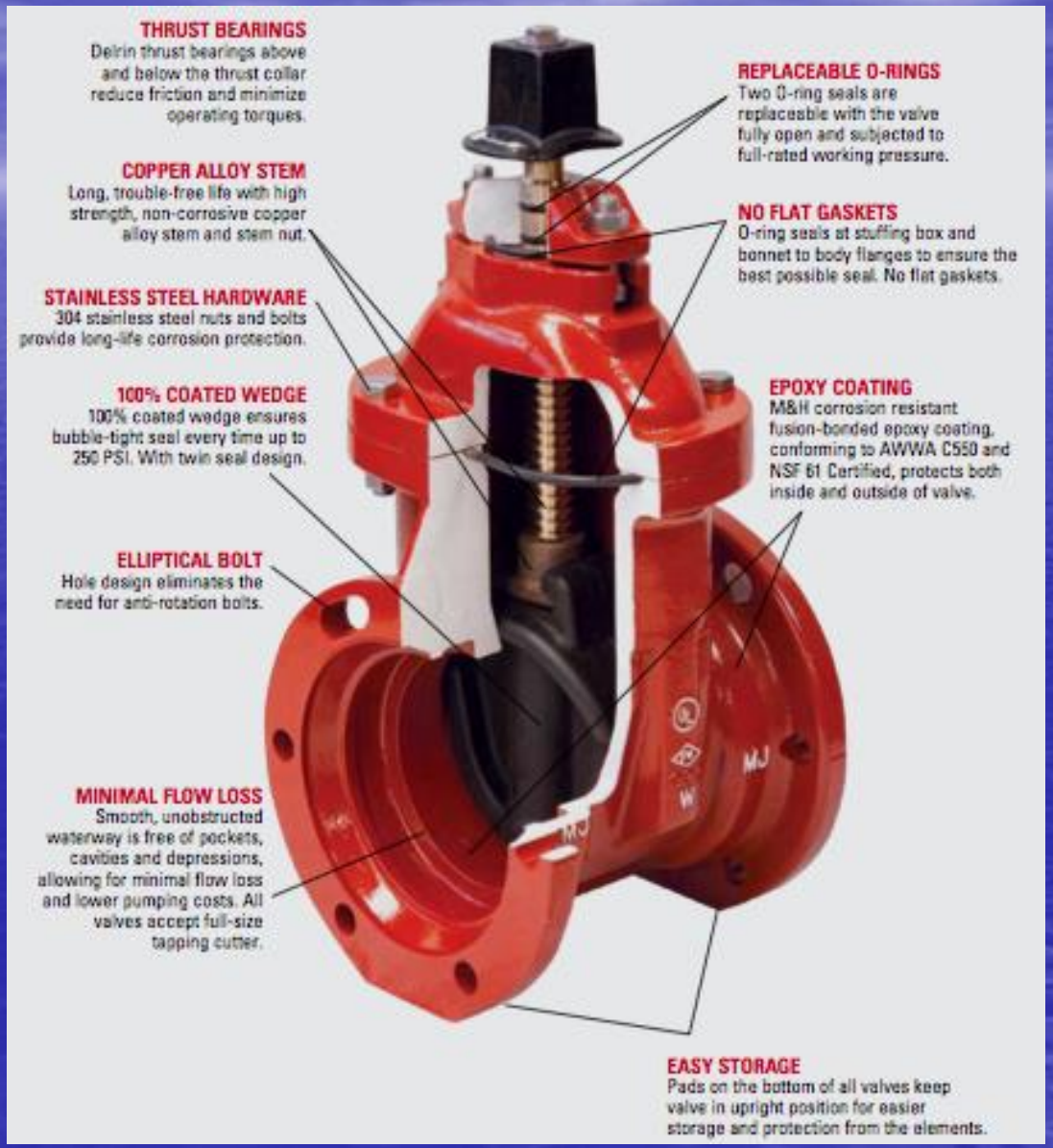
K-81 Vintage

Valves

There are only 3 internal parts in the Resilient Wedge Gate Valve

Most commonly you're going to replace the stuffing box. With the current valves most manufactures are producing, you can change the stuffing box o-ring under pressure. Not recommended

Turns to open



Thank you!

- Any questions?

Ryan Bordinger
Kennedy Valve