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KENNEDY VALVE

A DIVISION OF FOMBERG, INC. | ASSOCIATED WITH AWWA, NSF AND ULPH

RECOMMENDED SPECIFICATIONS FOR C-515 RESILIENT WEDGE GATE VALVES

KENNEDY VALVE

RESILIENT SEATED GATE VALVE 4"-24" C-515

1. Valves shall conform to the latest version of AWWA Standard C-515 covering Resilient Seated gate Valves for Water Supply Service.
2. The valves shall have a ductile iron body and bonnet. The wedge shall be totally encapsulated with rubber.
3. The sealing rubber shall be permanently bonded to the wedge to meet ASTM tests for rubber metal bond ATSM D249.
4. Valves shall be supplied with O-Ring seals at all joints. No flat gaskets shall be allowed.
5. The valves shall be either non-rising or rising stem, opening by turning left to right, and provided with 2" square operating nut or a handwheel with the "Open" and an arrow cast in the metal to indicate the direction to open.
6. Stems for NRS assemblies shall be cast bronze with integral collars in full compliance with AWWA. OS&Y (rising stems) shall be of stainless steel. All stems shall operate with bronze stem nuts, independent of stem (in NRS valves). NRS stems shall have (2) O-Rings located above thrust collar and (1) O-Ring below. All stem O-Rings shall be replaceable with valve fully opened and subjected to full pressure. The NRS stems shall also have (2) low torque thrust bearings located above and below stem collar to reduce friction during operation.
7. Waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves shall accept a full size tapping cutter.
8. The body, bonnet and stuffing plate shall be coated with fusion bonded epoxy, both interior and exterior on body and bonnet. Epoxy shall be applied in accordance with AWWA C550 and be NSF61 and NSF372 certified. PIV plates shall be painted black.
9. Each valve shall have a maker's name, pressure rating, and year in which it was manufactured cast in the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to requirements of AWWA.
10. Valves shall have all brass components cast and assembled in the USA and shall be manufactured by Kennedy Valve Company or equal.

**KS-RW (C515)
MATERIAL SPECIFICATIONS**

KENNEDY VALVE

Material Specifications

DUCTILE IRON Specification ASTM A536 Grade 70-50-5

Physical Properties

Minimum tensile strength	70,000 psi
Minimum transverse strength	50,000 lbs
Minimum deflection (12" centers)	5%

STANDARD

CAST BRONZE - ASTM B584 C87850 (Stem Nut)

Physical Properties

Minimum tensile strength	59,000 psi
Minimum yield strength	22,000 psi
Minimum elongation (in 2 inches)	16%

Chemical Analysis

Copper	74.0-78.0
Lead (maximum)	0.09
Tin (maximum)	0.30
Iron (maximum)	0.10
Nickel (maximum)	0.20
Zinc	Remainder
Silicon	2.7-3.4
Manganese (maximum)	0.10

CAST BRONZE - ASTM B584 C86700 (NRS Stem)

Physical Properties

Minimum tensile strength	80,000 psi
Minimum yield strength	32,000 psi
Minimum elongation (in 2 inches)	15%

Chemical Analysis

Copper	57.0 - 60.0
Lead (maximum)	.50 - 1.50
Aluminum	1.0 - 3.0
Iron	1.0 - 3.0
Nickel (maximum)	1.0
Zinc	30.0 - 38.0
Tin (maximum)	1.5

(EPDM) Ethylene Propylene Diene Monomer

Hardness (Shore A)	80± 5
Tensile (PSI)	1,500 min
Elongation (%)	150 min
Compression set, ASTM D395 Method B	20% max

**KS-RW (C515)
LOW ZINC
MATERIAL SPECIFICATIONS**

KENNEDY VALVE

Material Specifications

ALTERNATE

CAST BRONZE - NDZ ASTM B763 C99500 (NRS Stem & Stem Nut)

Physical Properties

Minimum tensile strength	70,000 psi
Minimum yield strength	40,000 psi
Minimum Elongation (in 2 inches)	12%

Chemical Analysis

Copper	Remainder
Lead (maximum)	.25
Aluminum	0.5 - 2.0
Iron	3.0 - 5.0
Nickel	3.5 - 5.5
Zinc	0.5 - 2.0
Silicon	0.5 - 2.0
Manganese (maximum)	0.5

**KS-RW (C515)
STEM MATERIAL OPTIONS**

KENNEDY VALVE

Additional Stem Material Options

NRS Stems
4"-12"
ASTM B584 C86700 Manganese Bronze ASTM B763 C99500 NDZ Bronze ASTM A479 304 Stainless Steel ASTM A479 316 Stainless Steel
14"-24"
ASTM B584 C86200 Manganese Bronze ASTM B763 C99500 NDZ Bronze ASTM A479 304 Stainless Steel ASTM A479 316 Stainless Steel

OS&Y Stems
4" - 12"
ASTM A479 304 Stainless Steel ASTM A479 316 Stainless Steel ASTM B371 C69300 Eco Brass
14"-24"
ASTM A479 304 Stainless Steel ASTM A479 316 Stainless Steel ASTM B371 C69300 Eco Brass

ASTM A479 304 Stainless Steel

Physical Properties

Minimum tensile strength	75,000 psi
Minimum yield strength	30,000 psi
Minimum Elongation (in 2 inches)	40%

Chemical Analysis

Carbon (maximum)	0.07
Phosphorus (maximum)	0.045
Sulfur (maximum)	0.03
Chromium	18.0 - 20.0
Nickel	8.0 - 10.5
Nitrogen (maximum)	0.1
Silicon (maximum)	0.75
Manganese (maximum)	2.0

ASTM A479 316 Stainless Steel

Physical Properties

Minimum tensile strength	75,000 psi
Minimum yield strength	30,000 psi
Minimum Elongation (in 2 inches)	40%

Chemical Analysis

Carbon (maximum)	0.08
Phosphorus	0 - 0.045
Sulfur (maximum)	0.3
Chromium	16.0-18.0
Nickel	10.0-14.0
Nitrogen (maximum)	0.1
Silicon (maximum)	0.75
Manganese (maximum)	2.0
Molybdenum	2.0 - 3.0

KS-RW (C515)
STEM MATERIAL OPTIONS

KENNEDY VALVE

Additional Stem Material Options (cont.)

ASTM B584 Manganese Bronze C86200

Physical Properties

Minimum tensile strength	90,000 psi
Minimum yield strength	45,000 psi
Minimum Elongation (in 2 inches)	18%

Chemical Analysis

Copper	60.0-66.0
Lead (maximum)	.20
Aluminum	3.0-4.9
Iron	2.0-4.0
Nickel (maximum)	1.0
Zinc (maximum)	22.0-28.0
Silicon (maximum)	0.20
Manganese (maximum)	2.5-5.0

ASTM B371 C69300 Eco Brass

Physical Properties

Minimum tensile strength	86,000 psi
Minimum yield strength	50,000 psi
Minimum Elongation (in 2 inches)	10%

Chemical Analysis

Copper	Remainder
Lead (maximum)	.25
Tin	0.5 - 2.0
Iron (maximum)	3.0 - 5.0
Nickel (maximum)	3.5 - 5.5
Zinc	0.5 - 2.0
Silicon (maximum)	0.75
Manganese (maximum)	2.0
Phosphorus	0.04-0.15

**2' - (, " KS-RW & FW
RESILIENT SEAT VALVE
FLOW COEFFICIENTS**

KENNEDY VALVE

Valve Size	Cv (Full Open)	K (Full Open)
2	300	0.15
2.5	500	0.13
3	800	0.115
4	1500	0.105
6	3600	0.09
8	6700	0.08
10	10500	0.08
12	15000	0.08
14	20800	0.08
16	27200	0.08
18	34400	0.08
20	42400	0.08
24	61100	0.08
30	95500	0.08
36	138000	0.08
42	187000	0.08
48	244000	0.08

$$C_v = \frac{Q}{\sqrt{\Delta P}} \quad K = f \frac{L}{D}$$

▲ P = (Delta P) Differential pressure (psi) between two points

Cv = Flow coefficient for valves: expresses flow rate in gallons per minute of 60°F water with 1.0 psi pressure drop across valve

Q = Rate of flow in gallons per minute

K = Resistance coefficient or velocity head loss

f = Friction factor

L = Length of pipe in feet

D = Internal diameter of pipe in feet

KS-RW & KS-FW POWDER COATING

KENNEDY VALVE

Kennedy Powder Coating is a high performance, one-part, heat-curable, thermosetting coating which provides superior corrosion resistance protection for metal parts.

Kennedy Powder Coating material is a stable, non-toxic resin consisting of 100% solids. It is impervious to and imparts no taste to potable water. Kennedy Powder Coating is formulated from materials deemed acceptable in the Food and Drug Administration Document Title 21 of the Federal Regulations for food additives, Section 175.300 entitled "Resinous and Polymeric Coatings".

Kennedy Powder Coating is applied by a heat application, fusion - bonding process which secures the coating material to the metal valve components. This process provides a coating averaging 9 mils thick with excellent adhesion qualities.

The durable Kennedy Powder Coating has a hard finish and exhibits excellent corrosion resistance in most aqueous solutions. It will not sag or cold flow or become soft during long-term storage. In addition to excellent corrosion resistance to aqueous solutions, the coating has excellent stability and resistance to acidic soil conditions.

Kennedy Powder Coating meets both the application and performance requirements of the American Water Works Association standard C-550 entitled "Protective Interior Coatings for Valves and Hydrants". It is also NSF61 and NSF372 certified.

The coating adhesion to the substrate shall exceed cohesion of the coating film as demonstrated by the following test:

1. Prepare test panel and apply coating per manufacturer's recommendation.
2. After sample has properly cured per manufacturer's recommendation, scribe an "X" using a sharp knife or scalpel through the coating to the metal substrate.
3. With the point of the knife at the junction of the two scribes, attempt to lift off the coating. Coating should not lift off substrate or between coats readily but should break up leaving coating material on the substrate of this damaged area.
4. No disbondment of the film shall be noted as tested above after immersion in tap water for 1500 hours at 100 degrees Fahrenheit.

Resilient Seated Gate Valves are available with the following coating options:

- The standard coating process provides a coating thickness of 6-9 mils dry film thickness (DFT).
- The seawater coating process provides a coating thickness of 9 mils minimum DFT.
- The holiday free coating process provides a coating thickness of 9 mils minimum DFT. The coating is checked for discontinuities (voids, cracks, thin spots, seams, porosity, pinholes, etc.) using an electrometer.

CR (CORROSION RESISTANCE) COATING

KENNEDY VALVE

CHEMICAL	EPOXY RATING		CHEMICAL	EPOXY RATING	
	70°F	180°F		70°F	180°F
ACIDS:			ALKALIES:		
Acetic, 10%	F	N	Ammonium Hydroxide	E	G
Benzene Sulfonic, 10%	E	E	Calcium Hydroxide	E	E
Benzoic	E	E	Potassium Hydroxide	E	E
Boric	E	E	Sodium Hydroxide	E	E
Chloracetic, 10%	E	E	ACID SALTS:		
Chromic, 5%	F	N	Aluminum Sulfate	E	E
Citric, 10%	E	N	Ammonium Chloride*	E	E
Fatty Acids	E	E	Copper Chloride*	E	E
Formic, 90%	E	F	Iron Chloride*	E	E
Hydrobromic, 20%	G	G	Nickel Chloride*	E	E
Hydrochloric, 20%	E	G	Zinc Chloride*	E	E
Hydrocyanic	E	E	ALKALINE SALTS:		
Hydrofluoric, 20%	G	G	Barium Sulfide	E	E
Hypochlorous, 5%	F	N	Sodium Bicarbonate	E	E
Lactic, 5%	F	N	Sodium Carbonate	E	E
Maleic, 25%	E	E	Sodium Sulfide	E	E
Nitric, 5%	E	G	Trisodium Phosphate	E	E
Nitric, 30%	G	P	NEUTRAL SALTS:		
Oleic	E	E	Calcium Chloride*	E	E
Oxalic	E	E	Magnesium Chloride*	E	E
Phosphoric	G	F	Potassium Chloride*	E	E
Picric	G	F	Sodium Chloride*	E	E
Steric	E	E	SOLVENTS:		
Sulfuric, 50%	G	F	Alcohols	E	E
Tannic	E	E	Aliphatic Hydrocarbons	E	E
			Aromatic Hydrocarbons	E	E
Ketones	F	F	Benzene	E	E
Ethers	F	F	Formaldehyde, 37%	E	G
Esters	F	F	Phenol, 5%	G	F
Gasoline	E	E	Mineral Oils	E	E
Carbon Tetrachloride	E	E	Vegetable Oils	E	E
Organics:			Chlorobenzene		
Aniline	G	P			

KEY: E - no attack
 G - appreciably no attack
 F - some attack, but useable in some instances
 P - attacked, not recommended for use
 N - rapidly attacked
 * - and nitrate and sulfate

**PRODUCT ANALYSIS
MODELS KS-FW & KS-RW
RESILIENT WEDGE VALVE**

KENNEDY VALVE

Features	Benefits
Bubble Tight at 250 psi	<ul style="list-style-type: none"> ● No Leakage - no loss of water
Smooth, Unobstructed Waterway	<ul style="list-style-type: none"> ● High flow characteristics ● 100% smooth passage without turbulent flow ● No sediment build-up ● Will not impede travel of line cleaning tools
Only Three Internal Parts	<ul style="list-style-type: none"> ● Virtually maintenance free
No Seat Rings	<ul style="list-style-type: none"> ● Nothing to be damaged by scoring
Anti-Friction Thrust Bearing	<ul style="list-style-type: none"> ● Operating torque to close and open held to absolute minimum
Solid, Bronze Stem Nut and High Strength Bronze Stem	<ul style="list-style-type: none"> ● No corrosion ● Trouble-free service
Stem Nut is Self Centering	<ul style="list-style-type: none"> ● Eliminates possible stress on stem and wedge
Two "O" Ring Seals Above Stem Thrust Collar	<ul style="list-style-type: none"> ● Can be replaced with valve in service
Third O-Ring Below Stem Collar	<ul style="list-style-type: none"> ● Facilitates Repacking Under Pressure
High Strength Iron Wedge Fully Encapsulated with Rubber Permanently Bonded to Metal. Wedge Design Incorporated Two Seating Surfaces	<ul style="list-style-type: none"> ● Trouble-free service with minimum maintenance ● No Leaks - no wear
High Strength Cast or Ductile Iron Body, Bonnet and Stuffing Box	<ul style="list-style-type: none"> ● Superior tensile strength ● Meets or exceeds AWWA C509 or C515 standards

**RECOMMENDED SPECIFICATIONS
FOR C-509 & C-515 RESILIENT
WEDGE GATE VALVES**

KENNEDY VALVE

URNS TO FULLY OPEN RSGV

MODEL KS-FW (C509) and KS-RW (C515)

SIZE	Without Gearing	With Spur Gear	With Bevel Gear
2"	6 1/2	---	---
2 1/2"	8	---	---
3"	10	---	---
4"	13 1/2	---	---
6"	19 1/2	---	---
8"	25 1/2	---	---
10"	31 1/2	---	---
12"	37 3/4	---	---
14"	52	104	104
16"	52	104	104
18"	64	192	192
20"	64	192	192
24"	76	228	228
30"	98	588	588
36"	114	684	684
* 42"	100	800	800
* 48"	100	800	800
* 54"	100	800	800

* 2TPI Stem Threads

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Kennedy Valve

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