

# **Master Valve Triple Offset Butterfly Valve Series**



**Coretech Flow America INC**

# Design of Triple Eccentric Construction

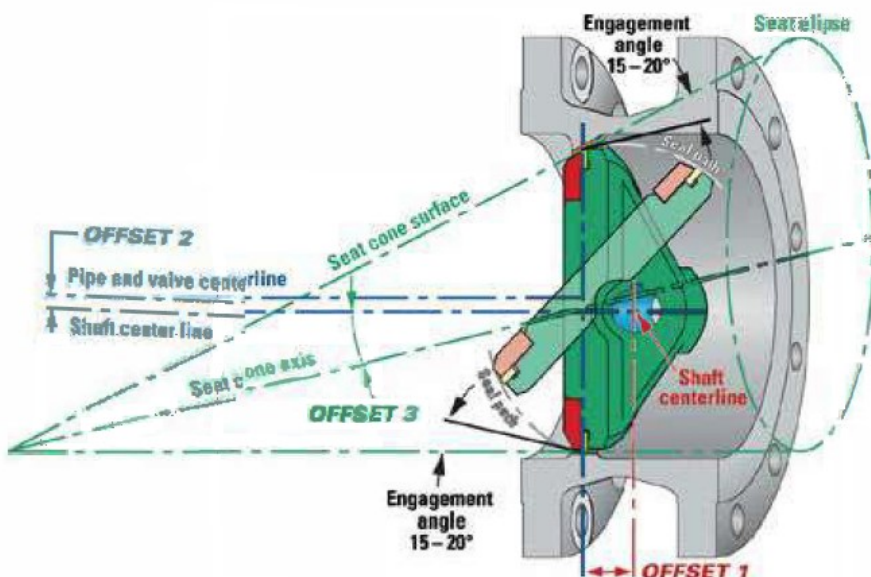
## THE TRIPLE -OFFSET GEOMETRY

Shut-off position without rubbing or galling, providing a torque generated resilient seal with sufficient "wedging" to ensure a uniform seal contact.

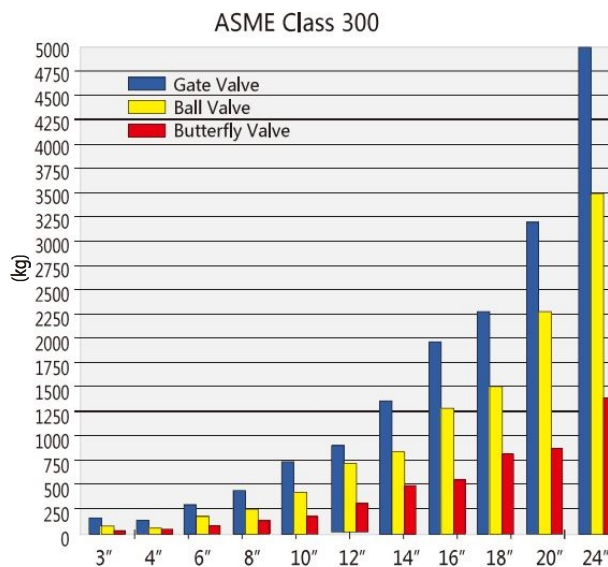
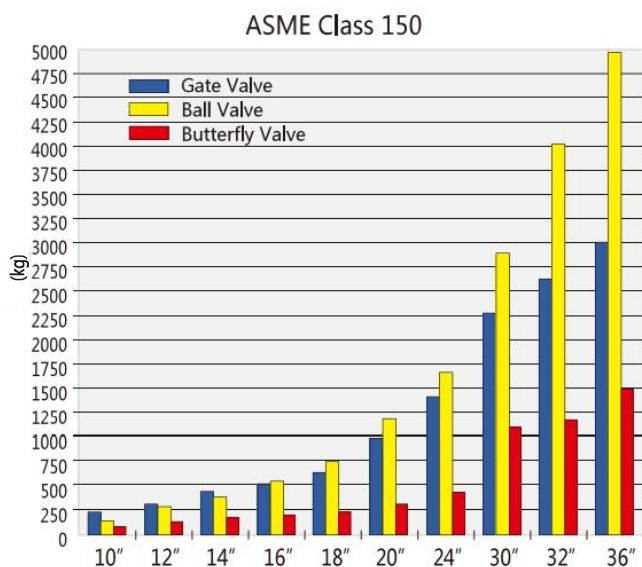
**OFFSET 1:** The shaft is offset behind the seat axis to allow complete sealing contact around the entire seat.

**OFFSET 2:** The shaft centerline is offset from the pipe and valve which provides interference free opening and closing of the valve.

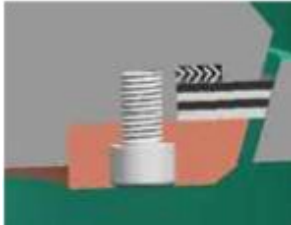
**OFFSET 3:** The seat cone axis is offset from the shaft centerline to eliminate friction during closing and opening and to achieve uniform compressive sealing around the entire seat.



## COMPARE THE WEIGHTS



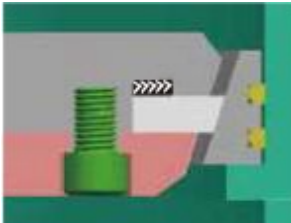
# Design of Triple Eccentric Construction



## FEATURE FOR BI-DIRECTIONAL

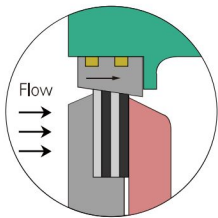
Master Valve provides a multi-layer seal ring with a extra rigid retaining ring with bolting on the disc, designed in response to ASME stress calculations.

- (1) The seat is hardfaced with Stellite, friction free sealing for long cycle life
- (2) The gasket is spiral wound SS/Graphite for zero leakage.
- (3) Carbon/Stainless Steel construction and metallic seal provide inherent Fire Safe Function.



Master Valve provides an extra active seat ring with O-Rings in the body.

- (1) A Stainless Steel seat ring with electroplated Chrome, friction free sealing against the seal ring with seat for a long cycle life.
- (2) The seat ring can active and adjust by itself to match the seal ring from disc.
- (3) The O-Ring is made of Rubber or Fluor plastic for different projects Maximal temperature is: 325°C / 608°F.
- (4) Performance: Multi-Layer SS/Graphite Seal Ring can be zero leakage from 100% bi-directional.



Preferential Side

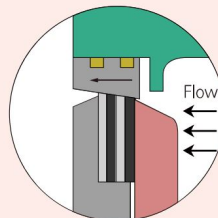
## DESIGN FOR BI-DIRECTIONAL

### **Preferential Side**

When valve is closing, discal ring been moved to contact the seat.

With the same eccentric angle, seal ring contact seat closely, drive the seat move towards body seat.

O-Rings provide a tight seal between seat and body Seal ring provide a tight seal between seat and seal.



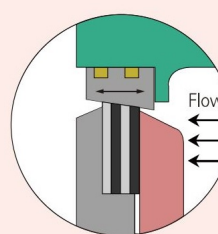
Reversed Side(A)  
Big pressure Difference

### **Reversed Side (A)**

A big pressure difference, stem force hold the disc/ seal ring not moved, flow pressure drive the seat contact seal ring closely.

O-Rings provide a tight seal between seat and body.

Seal ring provide a tight seal between seat and seal.



Reversed Side(B)  
Small Pressure Difference

### **Reversed Side (B)**

A small pressure difference, flow pressure didn't have enough power to drive the seat to seal ring.

Keep closing disc / seal to contact the seat, drive the seat move towards body seat.



O-Rings provide a tight seal between seat and body Seal ring provide a tight seal between seat and seal.

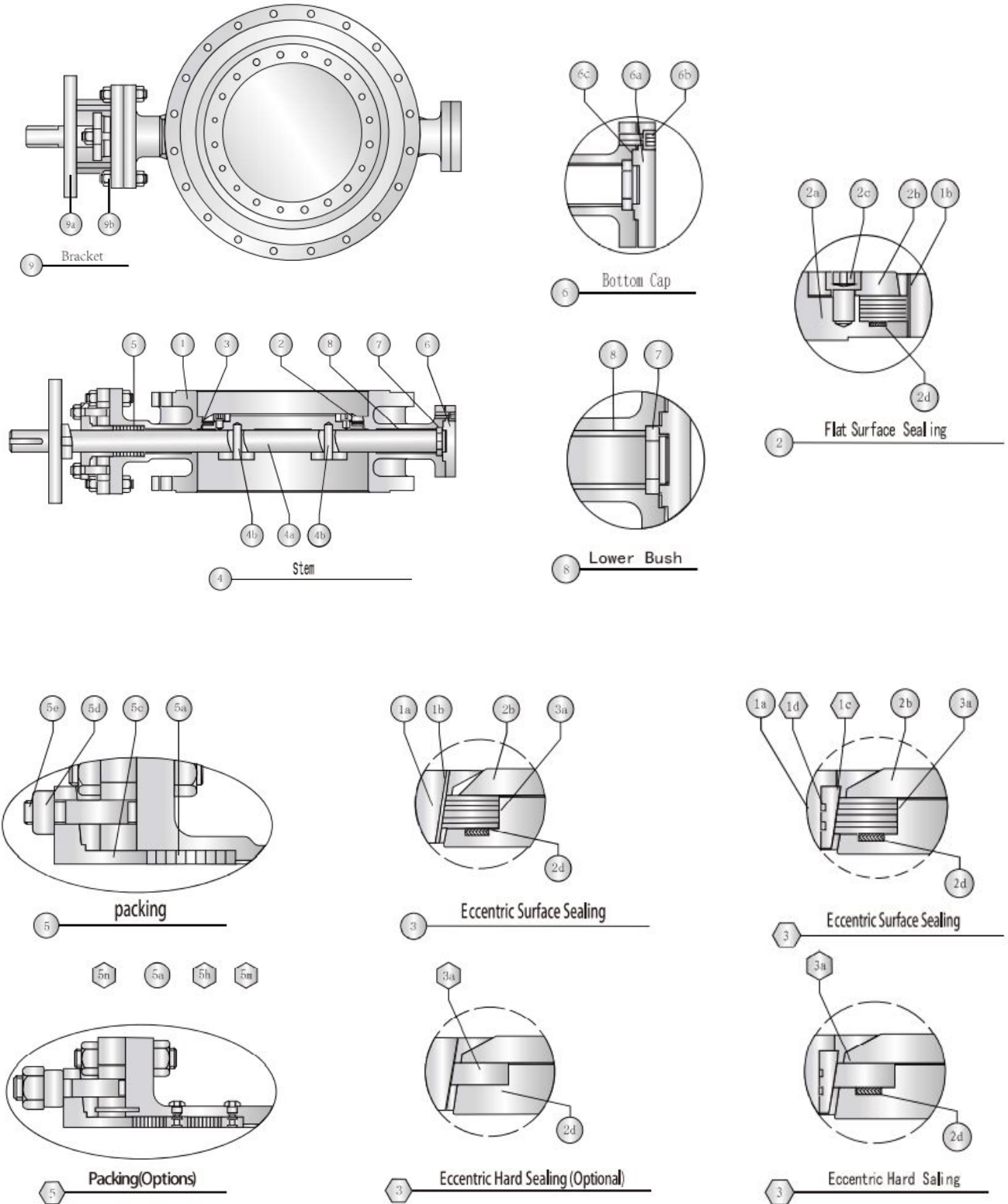
# Features and Benefits

1. Triple Eccentric Design:  
Eliminates wear associated with sealing surface contact and maintains sealing integrity and high cycle life
2. Wide Angle Seat Design:  
Eliminates wedging and binding of the seat / disc engagement
3. Torque Seated Resilient Multi-Layer Seal Ring:  
Provides reliable zero leakage and bi-directional
4. Bubble - Tight Closure:  
Provides process efficiency with reduced cost of maintenance
5. New Seat Ring Construction for Bi-Directional:  
New independent and oneself adjust seat can match with seal ring in the disc from eccentric design
6. Robust Single-Piece Shaft:  
Minimizes shaft deflection and permits bi-directional sealing bubble-tight closure
7. Optional Stellite Seat:  
Offer optimum resistance to erosion in abrasive and high velocity applications
8. No Plastics or Elastomers:  
Prevent fire-safe system security at extreme temperatures
9. Blowout - Proof Shaft:  
Complies with API609 to improve safety for operating personnel
10. Optional ASME B16.10 Flange:  
Interchangeable with Gate Valve and Ball Valve lay lengths
11. Quarter Turn Design:  
Reduces emissions and improves containment integrity from packing
12. 90°Low Torque Actuation:  
Enables simplified, cost-effective automation
13. Inherent Fire Safe Function:  
Carbon/Stainless Steel construction and metallic seal provide Inherent Fire Safe Function



# Basic Configuration Sectional Drawing -Conventional Series

-  Basic Configuration
-  Optional



# Typical Material Selection -Conventional Series

## Material List, According To ASTM Standard

Item	Part Name	Material List	Material List
1a	Body	ASTM A216 WCB	ASTM A351 CF8
1b	Body Seat	Overlay 13%Cr / Stellite	Integral Body / Overlay Stellite
2a	Disc	ASTM A216 WCB	ASTM A351 CF8
2b	Seat Protection Ring	ASTM A105	ASTM A182 F304
2c	Hex. Socket Screw	Stainless Steel A2	Stainless Steel A2
2d	Fire Safe Gasket	AISI 304+Graphite	AISI 304+Graphite
3a	Mult-Layer Seal Ring	AISI 304+Graphite	AISI 304+Graphite
4a	Stem	ASTM A182 420	ASTM A182 F304
4b	Dowel Pin	ASTM A105	AISI 304
5a	Packing	Graphite	Graphite
		PTFE(RPTFE)	PTFE(RPTFE)
5c	Packing Gland	ASTM A216 WCB	ASTM A351 CF8
5d	Nut	ASTM A194 2H	ASTM A194 8
5e	Bolt	ASTM A193 B7	ASTM A193 B8
6a	Botton Cap	ASTM A105	ASTM A182 F304
6b	Hex. Socket Screw	Carbon Steel	Stainless Steel A2
6c	Gasket	AISI 304+Graphite	AISI 304+Graphite
7	Retainer Ring	ASTM A182 F6a	ASTM A182 F304
8a	Bush	SF -1B	AISI 304
		AISI 316	*****
9a	Bracket	ASTM A216 WCB	ASTM A216 WCB
		*****	ASTM A351 CF8
9b	Bracket Nut	ASTM A193 B7	ASTM A193 B8

## Options Available Upon Request

Lubrication		Material List	Material List
5h	Lantern Ring	AISI 410	AISI 304
5m	Plug Valve	Stainless Steel	AISI 304
Live Loading Packing			
5n	Belleville Spring	Stainless Steel or Spring Steel Nickel Plated	
Fire Safe Design			
2d	Gasket	AISI 304+Graphite	AISI 304+Graphite
Hard Sealing Design			
3a	Hard Sealing Ring	ASTM A182 F304	ASTM A182 F304
New Seat Ring Design (temperature upto 250)			
1d	O-Ring	NBR / VITON	NBR / VITON
1c	New Seat Ring	ASTM A182 F304	ASTM A182 F304

# Triple Eccentric Butterfly Valve -Low/High Temperature



## Features

1. Valve design, including the extended bonnet, enables pipe insulation of the body.
2. The actuator remains protected from the extremely low/high line temperature.
3. Operability is not affected by temperature.
4. Production test API 598 to customer specification.
5. In-house testing in the fully equipped facilities at CZV plant.
6. The fully metal-to-metal torque seated design eliminates unpredictability related to the use of polymers in cryogenic configuration.
7. Cryogenic butt weld body style also available with tope entry flange for in line access requirements.



## Cryogenic Valves

Isolation, flow & pressure control, ON-OFF, emergency/safety operations, HIPPS, major equipment protective function (including: turbine expander, pump and compressor) in: LNG plants, carrier & terminal, air separation, gas treatment (e.g. molecular sieve), hydrocarbon cryogenic distillation, aerospace.

Fluids: Liquid propane, oxygen, liquid nitrogen, liquid hydrogen, glycol, ethylene glycol, ethylene.

## Technical Data

Design Standard:

API 609 & EN 593; ASME 816.34 & EN 12516 Ends Connection Standard:

ASME B16.5; ASME 816.47; EN 1092-1; ISO

7005; ASME 816.25 Size:

DN50 to DN1800 (2" to 72")

Face to face:

ISO 5752; EN558; ASME 816.1 O; API609

Pressure Ratings:

ASME from class 150LB to 900LB; EN from PN10 to PN160

Temperature:

from -254 °C to +250°C (-425.2°F to +482 °F); from: +450°C to +815°C (+842°F to +1500°F)



## High temperature valves

Design Standard:

Isolation, flow & pressure control, ON-OFF, switching, emergency/safety operations, HIPPS, major equipment protective function ( including: turbo expander and gas turbine ) in: heat exchanger, fuel cell, FCC (Fluid Catalytic Cracking), TRT (Top pressure Recovery .



Turbine), coal gasification, coal chemical, fertilizer plant, power plant, gas turbine, steam turbine, steel plant, solar power plant, aerospace.

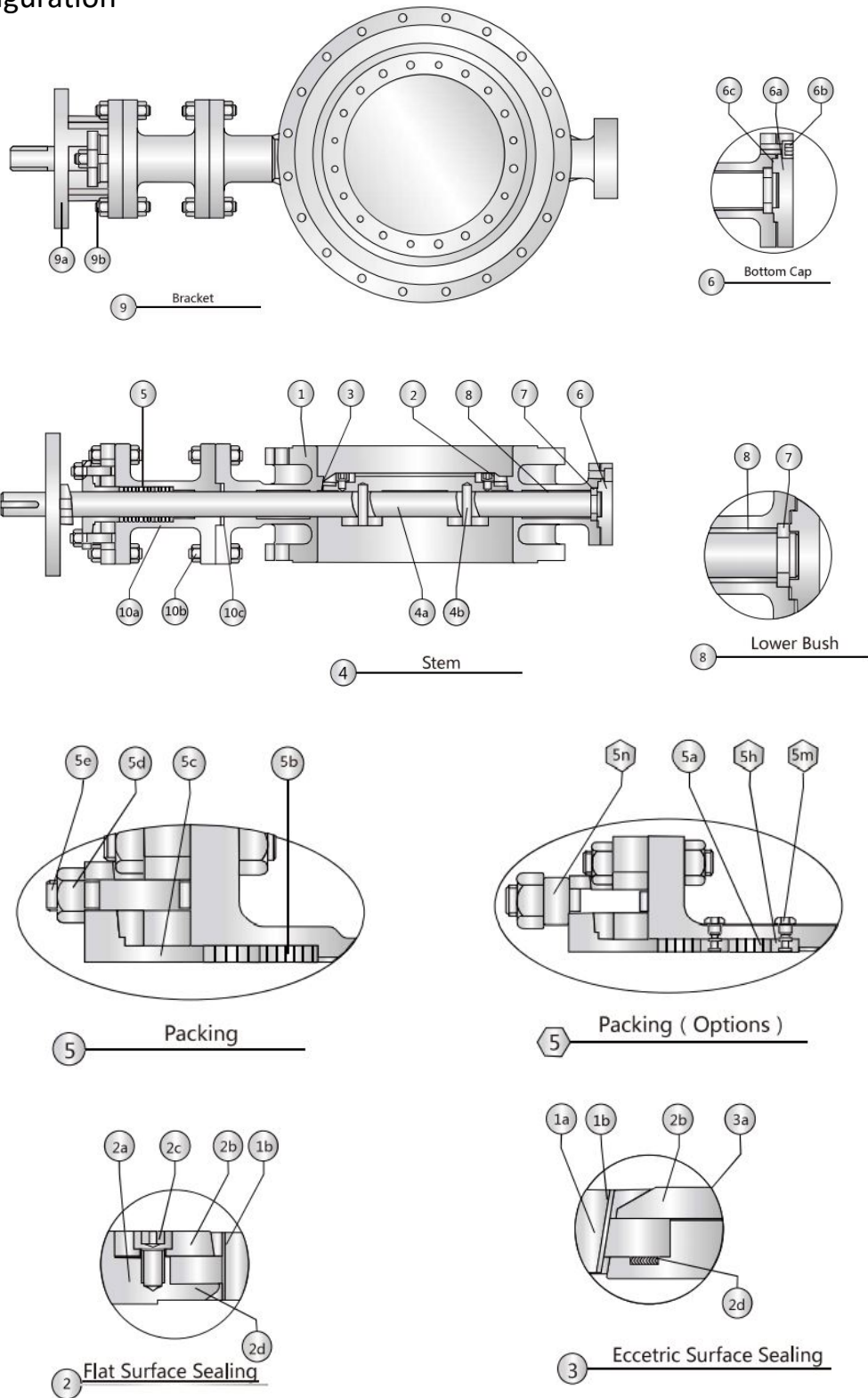
Fluid:

Super-heated steam, flue gas, exhaust gas, syngas, molten salt, coke oven gas, blast furnace gas, coal gas, combustion gas, HTF (Heat Transfer Fluid), hot air.



# Basic Configuration Sectional Drawing -Low Temperature Series

-  Basic Configuration
-  Optional





# Typical Material Selection -Low Temperature Series

## Material List, According To ASTM Standard

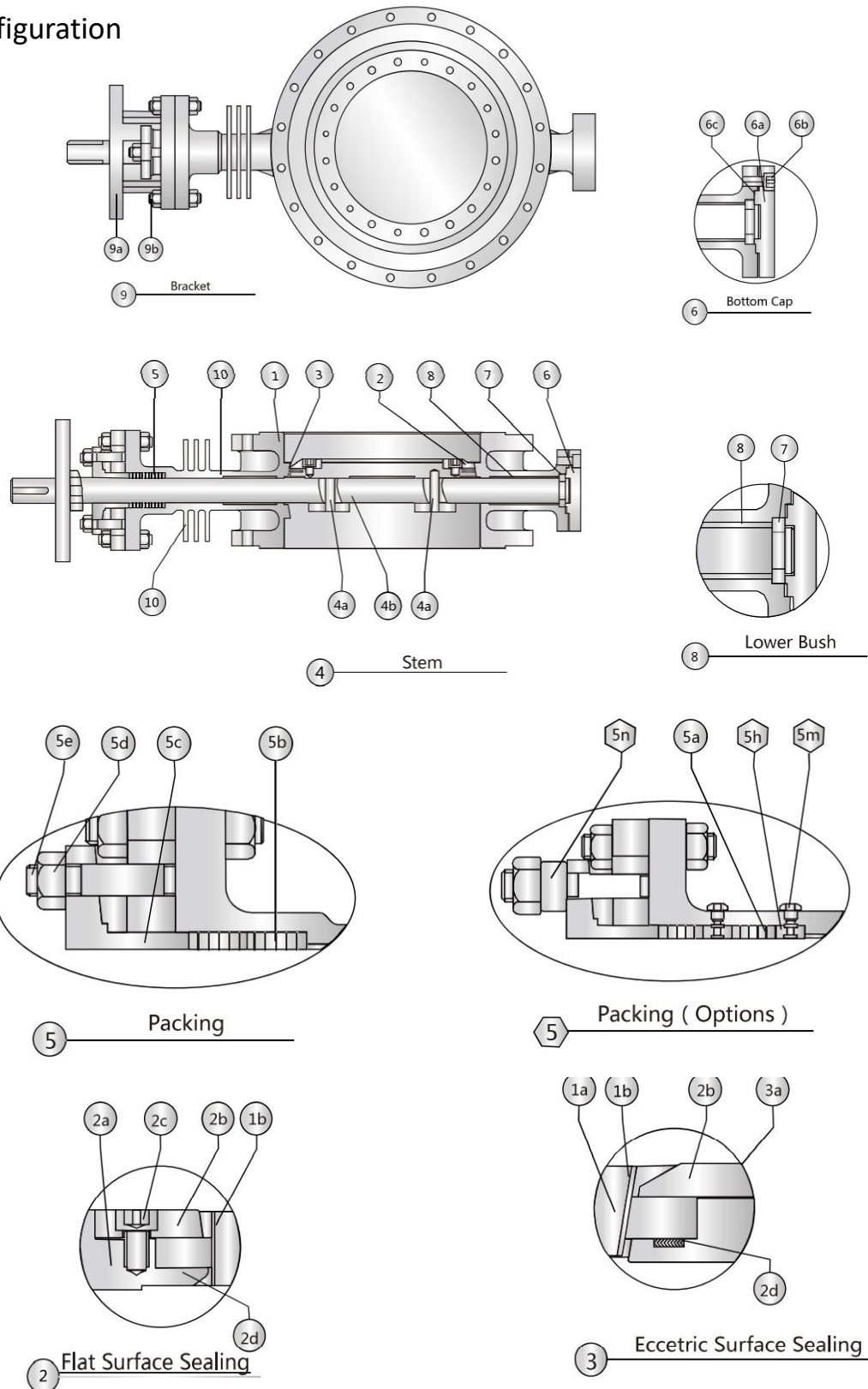
Item	Part Name	Material List(Low Temperature)	Material List(Stainless Steel)
1a	Body	ASTM A352 LCB	ASTM A351 CF8M
1b	Body Seat	overlay 13%Cr / Stellite	Inegral body / overlay Stellite
2a	Disc	ASTM A352 LCB	ASTM A351 CF8M
2b	Seat Protection Ring	ASTM A350 LF2	ASTM A182 F316
2c	Hex. Socket Screw	Stainless Steel A2	Stainless Steel A4
2d	Gasket	AISI 304+Graphite	AISI 316+Graphite
3a	Hard Seal Ring	ASTM A182 F304	ASTM A182 F316
	Multi-Layer Seal Ring	AISI 304+Graphite/PTFE	AISI 316+Graphite/PTFE
4a	Stem	ASTM A182 LF2	ASTM A182 F316
4b	Dowel Pin	AISI A350 LF2	AISI 316
5a	Specer	AISI 316	AISI 316
5b	Packing	Graphite	Graphite
5c	Packing Gland	ASTM A352 LCB	ASTM A351 CF8M
5d	Nut	ASTM A194 7M	ASTM A194 8M
5e	Bolt	ASTM A320 L7M	ASTM A193 B8M
6a	Bottom Cap	ASTM A350 LF2	ASTM A182 F316
6b	Hex. Socket Screw	ASTM A320 L7M	ASTM A193 B8M
6c	Gasket	ASI 304+Graphite	AISI 316+Graphite
7	Retainer Ring	ASTM A350 LF2	ASTM A182 F316
8	Bush	AISI 304	AISI 316
9a	Top Flange	ASTM A352 LCB	ASTM A351 C8FM
9b	Nut	ASTM A352 L7M	ASTM A193 B8M
10a	Bracket	ASTM A194 7M	ASTM A194 8M
10b	Bolt	ASTM A320 L7M	ASTM A193 B8M
10c	Gasket	SS 304+Graphite	SS 316+Graphite

## Options Available Upon Request

Item	Part Name	Material List(Low Temperature)	Material List(Stainless Steel)
	Lubrication	Stainless Steel	Stainless Steel
5h	Lantern Ring	AISI 304	AISI 316
5m	Plug Valve	ANSI 304	ANSI 316
	Live Loading Packing		
5n	Belleville Spring	Stainless Steel or Spring Steel Nickel Plated	

# Basic Configuration Sectional Drawing -High Temperature Series

- Basic Configuration
- ⬡ Optional



# Typical Material Selection -High Temperature Series

## Material List, According To ASTM Standard

Item	Part Name	Material List (Low Temperature)	Material List (Stainless Steel)
1a	Body	ASTM A217 WC6	ASTM A351 CF8M
1b	Body Seat	Overlay 13%Cr / Stellite	Integral Body / Overlay Stellite
2a	Disc	ASTM A217 WC6	ASTM A351 CF8M
2b	Seat Protection Ring	ASTM A182 F11	ASTM A182 F316
2c	Hex. Socket Screen	Stainless Steel A2	Stainless Steel A4
2d	Gasket	AISI 316+Graphite	AISI 316+Graphite
3a	Hard Seal Ring	ASTM A182 F304	ASTM A182 F316
4a	Stem	ASTM A182 F11	ASTM A182 F316
4b	Dowel Pin	ASTM A182 F11	ASTM A182 F316
5a	Spacer	AISI 304	AISI 316
5b	Packing	Graphite	Graphite
5c	Packing Gland	ASTM A217 WC6	ASTM A351 CF8M
5d	Nut	ASTM A194 4	ASTM A194 8M
5e	Bolt	ASTM A193 B16	ASTM A193 B8M
6a	Bottom Flange	ASTM A182 F11	ASTM A182 F316
6b	Hex. Socket Screen	ASTM A193 B16	ASTM A193 B8M
6c	Gasket	SS 304+Graphite	SS 316+Graphite
7	Retainer Ring	ASTM A182 F11	ASTM A182 F316
8	Bushing	AISI 304	AISI 316
9a	Bracket (top flange)	ASTM A217 WC6	ASTM A351 C8FM
9b	Bracket (top flange) Nut	ASTM A193 B16	ASTM A193 B8M
10	Cooling Fin	ASTM A217 WC6	ASTM A351 C8FM

## Options Available Upon Request

Item	Part Name	Material List(High Temperature)	Material List(Stainless Steel)
	Lubrication	Stainless Steel	Stainless Steel
5h	Lantern Ring	AISI 304	AISI 316
5m	Plug Valve	ANSI 304	ANSI 316
	Live Loading Packing		
5n	Belleville Spring	Stainless Steel or Spring Steel Nickel Plated	

# How To Order Butterfly Valve

## Butterfly Valve Part Number

Size of Connection			Valve	End	Class	Body	Body Seat	Disk Seal	Disk	Stem	Operator
A			B	C	D	E	F	G	H	I	J
1	8	0	T	3	3	WCB	R	R	C	B	E

Example: 18", Triple Offset design Butterfly Valve, Wafer connection Class 300, Body Material: WCB, Body Seat Material: Stellite, Disk Seal Material: SS 304 & Graphite, Disk Material: CF8M, Stem Material: 17-4PH, Operator: Electrical actuator **180T-33-WCB-RR-CB-E**

0	3	0	S	2	1	WCB	P	1	C	A	L
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Example: 3", Standard concentric design butterfly valve, Lug connection Class 150, Body Material: WCB, Body Seat Material: Stellite, Disk Seal Material: Same as Disk, Disk Material: CF8M, Stem Material: 316, Operator: Lever operator **030S-21-WCB-P1-CA-L**

A Size of Connection		
005=0.50"	080 = 8.00"	240 = 24.0"
007 = 0.75"	100 = 10.0"	260 = 26.0"
010 = 1.00"	120 = 12.0"	280 = 28.0"
020 = 2.00"	140 = 14.0"	300 = 30.0"
030 = 3.00"	160 = 16.0"	360 = 36.0"
040 = 4.00"	180 = 18.0"	
060 = 6.00"	200 = 20.0"	

B Valve Type
T ---- Triple Offset design
D ---- Double Offset design
S ---- Concentric design

C End Connection
1---- Flanged RF
2---- Lug
3 ---- Wafer
4 ---- Butt Weld

D Class
1 ---- Class 150
3 ---- Class 300
6 ---- Class 600

E Body Material
WCB ---- WCB
CM8 ---- CF8M
DIN ---- Ductile Iron
126 ---- A126 Class B Gray Iron Casting

F Body Seat Material	
A -- SS316 & Graphite	N -- NBR (Nitrile Rubber)
B -- SS410 & Graphite	U -- Buna N
R -- SS304 & Graphite	E -- EPDM
S -- Stellite	G -- RPTFE (or RPTFE+O-Ring )

G Disk Seal Material	
1 -- Same as Disk Base Material	C -- SS316 & EPDM
A -- SS316 & Graphite	X -- NONE
B -- SS410 & Graphite	
R -- SS304 & Graphite	
S -- Stellite	
P -- RPTFE	
N -- Buna N	
E -- EPDM	

H Disk Material
WCB --- WCB
C --- CFM8
E --- Monel
DIN --- Ductile Iron
D --- AL - Bronze ASTM B148
A --- ASTM A536
B --- SS304

I Stem Material
A --- 316
B --- 17-4PH
C --- 4130
D --- 304
E --- 410
F --- 416
G --- F51

J Operator
A --- Actuator
B --- Bare Stem
E --- Electrical Actuator
G --- Gear

# Inspection & Quality Control

## Quality - Built for Last

Superior quality comes from advanced manufacturing capabilities, With the use of advanced production machine and equipment, high quality with advanced design can be manufactured in on a consistent basis.



Cryogenic Butterfly Valve



Hardness Inspection, Liquid Penetrant Test, and Helium Fugitive Emission Test



Material Chemical Analysis, Thickness Inspection, and Customer Inspection



**Coretech Flow America INC**

23555 Clay Road, Katy, TX 77493, USA  
+1 832-838-4999  
[www.coretechflow.com](http://www.coretechflow.com)