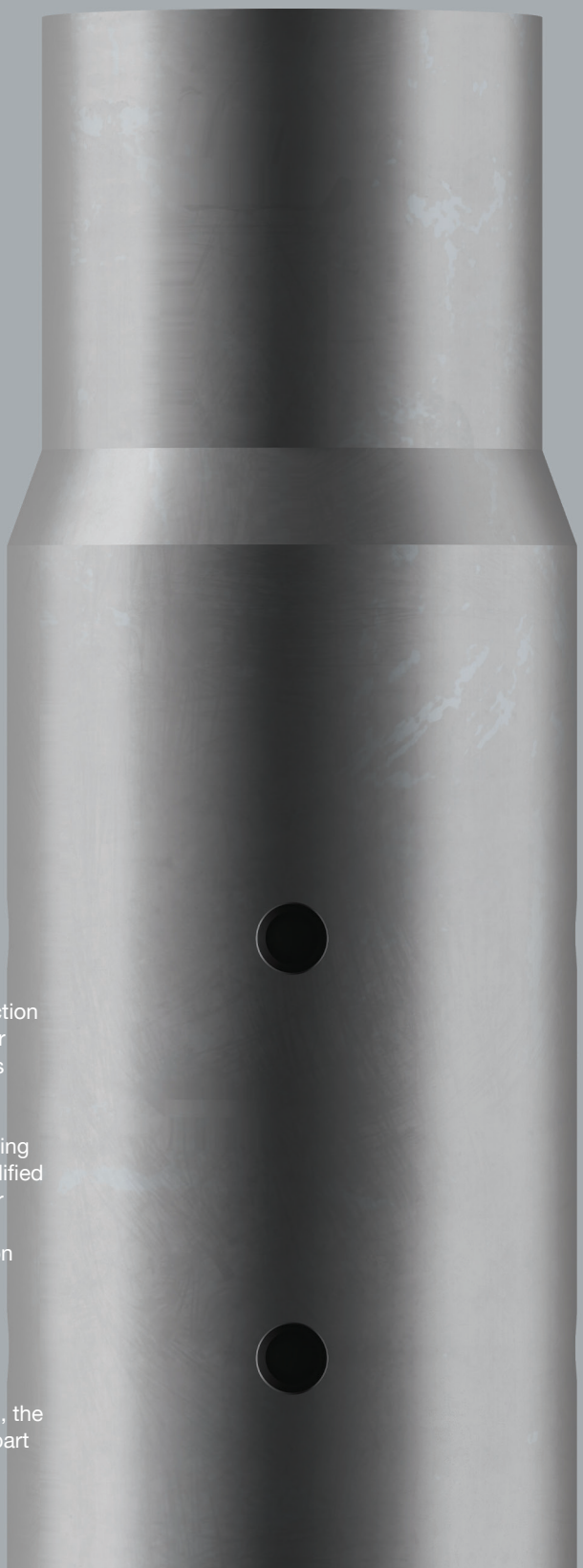
Welltec® Flow Valve (WFV™)



The Welltec® Flow Valve is a full-bore valve that can be used for both production and injection purposes within the lower completion, the rugged design enables rotation during liner deployment.

With specially designed inlets and sealing system, the Welltec® Flow Valve is qualified to open and close multiple times under differential pressure whilst maintaining flow, from both injection and production scenarios.

The full-bore design makes it ideal for intervention-enabled completions and together with Welltec® Annular Barrier providing high pressure Zonal Isolation, the Welltec® Flow Valve forms an integral part of the Flex-Well® completion.

Welltec®

For inflow & injection management

WFV™ Solutions available
WFV™ – DP (Dual Position)
WFV™ – CDP (Calibrated Dual Position)
WFV™ – MP (Multi Position)
Sand Screen integration available for all variants
High Temperature variants available

WFV™ – DP (Dual Position)

01	**Applications**
	Applicable for wells in reservoirs with high potential for fractures
	Isolate later water/gas breakthrough in Producers
	Delay bottom-up aquifer coning or gas cap cusping
	Selective zonal injection / stimulation within Injectors
02	**Features**
	Enabling isolation of water/gas breakthrough
	Flow areas 1.1 x Flow Area of Base Pipe
	ON - OFF slot design.
	Low profile with minimum impact on ECD
	Full bore design provides smooth flow area to minimize Delta P loss
	Coatings to minimize scale deposition
	Robust seal design for manipulation under Delta P
	High burst, collapse and torque capability
	All Variants can be combined with Sand Screens
03	**Benefits**
	No limitation on the quantity of WFVs per main bore or lateral
	Materials to match completion and environment
	Enabler for Cementless completions in combination with the WAB (Welltec® Annular Barrier)
	Enables rotation during completion
	Simple, reliable manipulation
04	**Deployment**
	Shifting by Well Stroker actuation or drive by solution
	SRO confirmation of sleeve position
	Standard shifting profile
	Liner can be worked and rotated during deployment
05	**Available Sizes and Specs**
	From 2 ⅞" WFVT™ to 9 ⅝" WFV*
	High Temperature WFV™ available
	Materials fit to meet Client Specifications for Pressure and Tensile
	Proper Datasheet will be deliver upon selected WFV™
	Other sizes available upon D&E request (Lead times and feasibility to be determined)

WFV™ – CDP (Calibrated Dual Position)

01	**Applications**
	Applicable for heterogeneous reservoirs
	Balance inflow profile across the reservoir via ICD design
	Isolate later water/gas breakthrough in Producers
	Delay bottom-up aquifer coning or gas cap cusping
	Both Selective zonal injection / stimulation and Balanced
02	**Features**
	Enabling delay & isolation of water/gas breakthrough
	Flow areas can be calibrated on site prior to deployment based on drilling information.
	ON - OFF nozzle design
	Low profile with minimum impact on ECD
	Inlet flow geometry to minimize erosion
	Full bore design provides smooth flow area to minimize Delta P loss
	Coatings to minimize scale deposition
	Robust seal design for manipulation under Delta P
	High burst, collapse and torque capability
	All Variants can be combined with Sand Screens
03	**Benefits**
	No limitation on the quantity of WFVs per main bore or lateral
	Materials to match completion and environment
	Enabler for Cementless completions in combination with the WAB (Welltec® Annular Barrier)
	Enables rotation during completion
	Simple, reliable manipulation
04	**Deployment**
	Shifting by Well Stroker actuation or drive by solution
	SRO confirmation of sleeve position
	Standard shifting profile
	Liner can be worked and rotated during deployment
05	**Available Sizes and Specs**
	From 2 ⅞" WFV™ to 9 ⅝" WFV*
	High Temperature WFV™ available
	Materials fit to meet Client Specifications for Pressure and Tensile
	Proper Datasheet will be deliver upon selected WFV™
	Other sizes available upon D&E request (Lead times and feasibility to be determined)

WFV™ – MP (Multi Position)

01	**Applications**
	Manage inflow profile across the reservoir via ICD design
	Applicable for heterogeneous reservoirs
	Applicable for water flooded carbonate reservoirs
	Establish initial uniform zonal flow along the well
	Optimize life of well performance
02	**Features**
	Enabling optimization of inflow profile and manage water/gas breakthrough
	Flow areas can be adjusted through life of well.
	Multiple ON positions + one OFF.
	Low profile with minimum impact on ECD
	Inlet flow geometry to minimize erosion
	Full bore design provides smooth flow area to minimize Delta P loss
	Coatings to minimize scale deposition
	Robust seal design for manipulation under Delta P
	High burst, collapse and torque capability
	All Variants can be combined with Sand Screens
03	**Benefits**
	No limitation on the quantity of WFVs per main bore or lateral
	Materials to match completion and environment
	Enabler for Cementless completions in combination with the WAB (Welltec® Annular Barrier)
	Enables rotation during completion
	Simple, reliable manipulation
04	**Deployment**
	Shifting by Well Stroker actuation or drive by solution
	SRO confirmation of sleeve position
	Standard shifting profile
	Liner can be worked and rotated during deployment
05	**Available Sizes and Specs**
	From 2 ⅞" WFV™ to 9 ⅝" WFV*
	High Temperature WFV™ available
	Materials fit to meet Client Specifications for Pressure and Tensile
	Proper Datasheet will be deliver upon selected WFV™
	Other sizes available upon D&E request (Lead times and feasibility to be determined)

WCS product specifications

Welltec® WFV™	General Information
Product Name	Welltec® Flow Valve (WFV™)
Product Variants	Dual Position, Calibrated Dual Position, Multi Position
Standard Profile Type	B Shifting Profile*
Primary Seal Material (non-elastomeric)	PTFE - 10% Carbon Fiber / PEEK
Secondary Seal (elastomeric)	HNBR / Aflas
Metallurgy Options	4140 / 13Cr / S13 Cr / 25 Cr / Inc 718 / 925

* Can be configured with other profile types if required

*Welltec® WFV™	278WFV*	312WFV*	412WFV*	512WFV*
Base-pipe Size**	2 ⅞"	3 ½"	4 ½"	5 ½"
Maximum Burst Pressure	10,000psi (689bar)			
Maximum Collapse Pressure	10,000psi (689bar)			
Maximum Diff. Unloading Pressure	1,500psi	1,500psi	1,500psi	2,000psi
Max OD	3.71"	4.57"	5.57"	6.89"
Min ID	Full-bore (As Per Base-Pipe ID)			
Flow Area Range Sqin	0.007" 2 > 110% of Base-pipe			
WFV™ - DP *	√	√	√	√
WFV™ - CDP *	–	√	√	√
WFV™ - MP *	√	√	√	√

*Welltec® WFV™	658WFV*	7WFV*	758WFV*	958WFV
Base-pipe Size**	6 ⅝"	7"	7 ⅝"	9 ⅝"
Maximum Burst Pressure	8,000psi (552bar)	5,000psi	7,500psi	7,500psi
Maximum Collapse Pressure	8,000psi (552bar)	5,000psi	6,000psi	6,000psi
Maximum Diff. Unloading Pressure	1,500psi	1,500psi	2,000psi	2,000psi
Max OD	8.10"	8.20"	7.8"	9.8"
Min ID	Full-bore (As Per Base-Pipe ID)			
Flow Area Range Sqin	0.007" 2 > 110% of Base-pipe			
WFV™ - DP *	√	√	√	√
WFV™ - CDP *	√	√	–	–
WFV™ - MP *	–	–	–	–

*Can be configured with wire-wrap or premium mesh screens for sand control applications
**Base-pipe Weight & Grade will match application requirement