DEEP HARBOUR

# FORMATION ISOLATION VALVE

APRIL 2025

# FORMATION ISOLATION VALVE

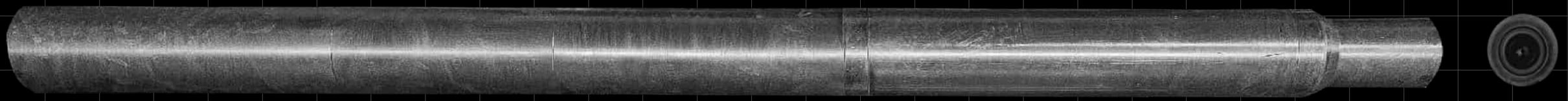
FIV

**The Deep Harbour** Formation Isolation Valve is a vital component in deepwater and high-pressure drilling and completion operations. Engineered for bidirectional well bore isolation, it offers both remote hydraulic actuation and manual shifting capabilities, minimizing rig time and enabling flexible intervention strategies.

# FEATURES AND SPECIFICATIONS

## BENEFITS

**The proposed FIV offers several benefits** // Efficient Reservoir Isolation // Flexible Application // Remote Operation



**VALVE TYPE**
Post-production/
Injection Type CC Valve

**OUTER DIAMETER (OD)**
8.00 inches
(203.2 mm)

**INNER DIAMETER (ID)**
4.50 inches
(114.3 mm)

**OVERALL LENGTH (OAL)**
242.90 inches
(6.17 meters)

**MAXIMUM TENSILE LOAD**
530,000 lbf
(240,404 kgf)

**WEIGHT**
1,832 lb
(830 kg)

**WORKING PRESSURE**
5,000 psi

**MAXIMUM BURST PRESSURE RATING**
6,500 psi (45 MPa)

**MAXIMUM COLLAPSE PRESSURE RATING**
6,500 psi (45 MPa)

**MATERIAL** 13CR 80KSI, QUENCHED AND TEMPERED MARTENSITIC STAINLESS STEEL
- Corrosion Resistance: Suitable for sweet ($CO_2$) and mildly sour ($H_2S$) environments up to 300°F
- Compliance: API 5CT, Group 2, Grade L80, Type 13Cr, NACE MR0175

**CONNECTION TYPE**
5.5" Vam Top or
JFE Bear connections

**VALVE TYPE**
Ball-type valve capable of holding pressure from above and below

**SHIFTING TOOL**
Custom shifting tool profile to open and close the valve

**DESIGN VALIDATION GRADE**
V2

**MATERIAL QUALITY GRADE**
Q2

**REMOTE HYDRAULIC ACTUATION**
One time open

**MANUAL OPERATION**
BHA

# ACTUATION AND CONTROL MECHANISMS

## REMOTE HYDRAULIC ACTUATION
- Annular Hydrostatic Pressure
- Hydraulic Dampening

## SLIP-SAFE COLLET MECHANISM
- Accidental Force Prevention
- Positive Shifting Only

## HIGH FORCE REMOTE ACTUATION
- Powerful Actuator Design
- Force Control

## REMOTE ACTUATION DEFEAT SYSTEM
- Automatic Disconnection
- Easy Subsequent Closing

## MANUAL SHIFTING MECHANISM
- Custom Shifting Tool and Collet Sleeve
- Secondary Shifting Profile

## CONFIGURABLE COUNTING MECHANISM
- Tubing Pressure Cycle Initiation
- Independent of TVD
- Externally Replaceable Rupture Disk

## PIN-GUARD J-SLOT DESIGN
- 7-Cycle Hydraulic Actuation
- Shear Pin Protection

# SEALING AND ISOLATION MECHANISM

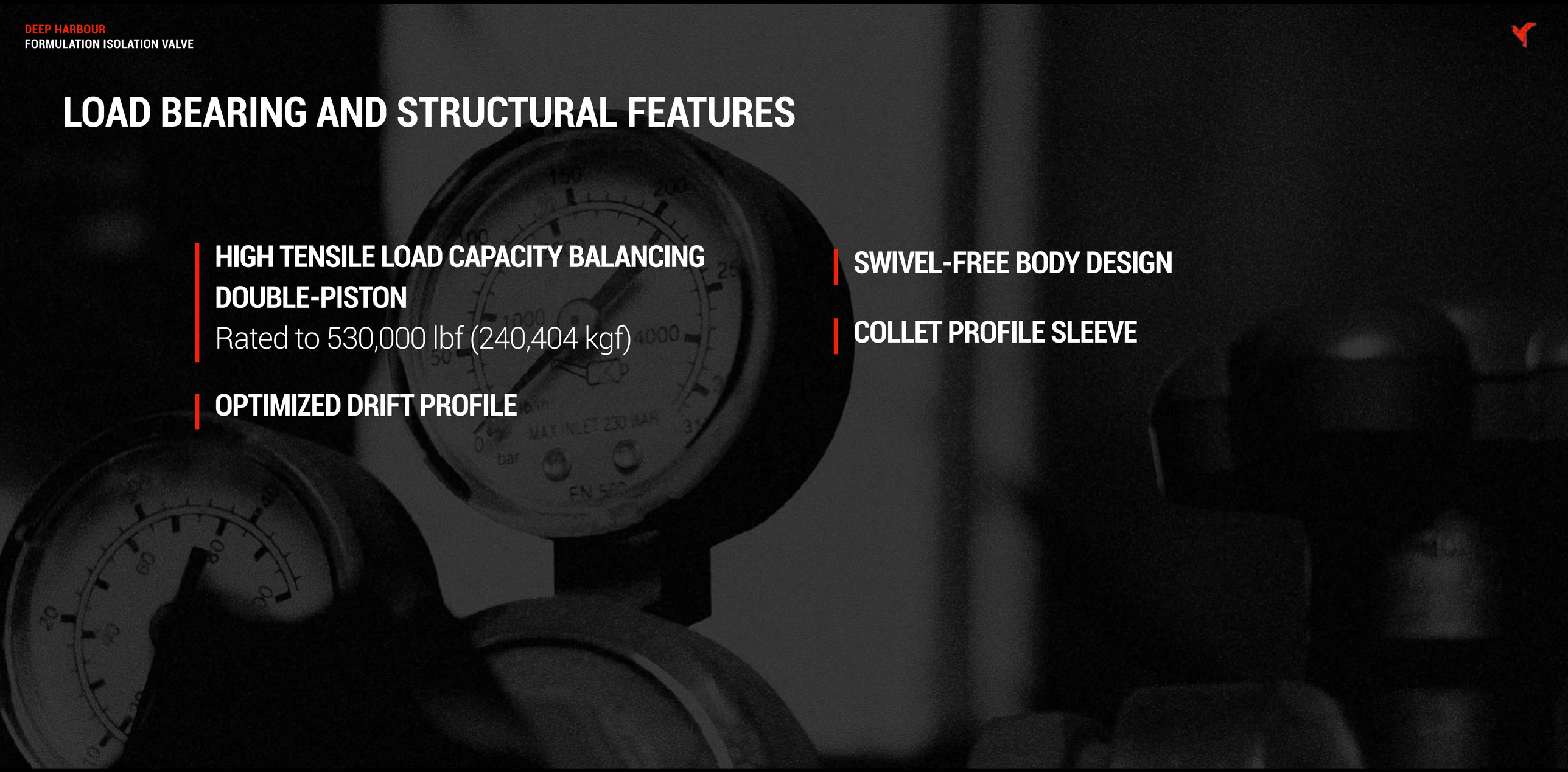
## PRESSURE DIFFERENTIAL COMPENSATED BALL VALVE

- Balancing Double-Piston
- Consistent Sealing

## DEBRIS MANAGEMENT AND SEAL PROTECTION

- Integrated Debris Relief Channels
  Actuation Chamber Isolation
- Superior Debris Management

# LOAD BEARING AND STRUCTURAL FEATURES



**HIGH TENSILE LOAD CAPACITY BALANCING DOUBLE-PISTON**
Rated to 530,000 lbf (240,404 kgf)

**OPTIMIZED DRIFT PROFILE**

**SWIVEL-FREE BODY DESIGN**

**COLLET PROFILE SLEEVE**

# MULTI-CYCLE OPERATIONAL CAPABILITIES AND INTEGRATION WITH LOWER COMPLETION SYSTEMS

## MCOCI

- MULTIPLE OPENING AND CLOSING CYCLES
- OPERABLE UNDER HIGH DIFFERENTIAL PRESSURE
- POST-COMPLETION REUSABILITY

## ICSLWI

- GRAVEL PACK (GP) COMPATIBILITY
- INTELLIGENT COMPLETION READY

# QUALIFICATION AND TESTING

**VALIDATION STANDARD**
ISO 28781:2010 (V2)

**HYDROSTATIC PRESSURE TESTING**
Conducted at full operational limits

**FLOWING SLURRY TESTING**
Demonstrates robust debris tolerance

**LEAKAGE INTEGRITY VERIFICATION**
Confirms liquid-tight sealing under differential pressure extremes

**OPERATIONAL LIFE CYCLE TESTING**
Ensures the valve can handle repeated actuations without degradation

# KEY CUSTOMER BENEFITS

## RELIABLE ISOLATION
Maintains liquid-tight seals even under HPHT conditions.

## FLEXIBLE OPERATION
Remote or manual shifting, multi-cycle usage, fail-as-is design, and easy reusability.

## ROBUST AND FIELD-PROVEN
Built to ISO standards and validated via extensive testing for consistent downhole performance.

## REDUCED RISK OF ACCIDENTAL ACTUATION
Slip-Safe Collet Mechanism and the Remote Actuation Defeat System mitigate unwanted ball movements.

## EXTENDED SHEAR PIN LIFE
Pin-Guard J-Slot Design handles multiple cycles without overloading shear pins.

# COMPLETION

By incorporating the Slip-Safe Collet Mechanism, Pin-Guard J-Slot Design, Configurable Counting Mechanism, and other advanced features, the Deep Harbour Surface-Controlled Formation Isolation Valve (FIV) sets a new standard for reliability, safety, and efficiency in high-pressure and deepwater completions. Every element is designed to:

- **OPTIMIZE RIG TIME** Fewer unplanned interventions and simplified operations
- **ENHANCE SAFETY** Fail-as-is configurations and protective design elements
- **SUPPORT FUTURE WELL STRATEGIES** Multi-cycle usage, re-completions, and intelligent completions

# THANK YOU

DEEP HARBOUR
Unit 105 - 4800 104 AVE SE, Calgary T2C 2H3 Alberta, Canada
mkal@deep-harbour.com