Schlumberger

HEWM

Hydraulic and electric downhole wet-mate connector

Rated up to 7,500 psi [52 MPa]

Rated to 311 degF [155 degC]

Compatible with Agiliti* modular digital completions

APPLICATIONS

- Multizone intelligent completions, including ESP combinations
- Auto (natural) gas lift wells
- Commingled-flow completions
- Compartmentalized horizontal wells
- Wells with water cut, scale deposition, or severe erosion issues
- Injection wells
- Extended-reach wells requiring dual-trip completions
- Vertical, highly deviated, or horizontal wells

BENEFITS

- Provides hydraulic and electrical connection in multistage intelligent completion wells
- Saves time by enabling replacement of upper completion without retrieval of lower completion
- Minimizes risks associated with workover operations

FEATURES

- Two subassemblies: receptacle in lower completion and stinger in upper completion
- Inductive coupling technology for immunity to debris and efficient power transmission and telemetry
- Protective sleeves in stinger and receptacle to prevent exposure of hydraulic ports and control lines to downhole fluids and debris
- Concentric union–type connection to simplify alignment at the wet mate
- Compatibility with IntelliZone Compact II* modular multizonal management system

The Schlumberger hydraulic and electric downhole wet-mate (HEWM) connector combines hydraulic wet-mate technology with an inductive coupler. This enables transmission of telemetry, electrical power, and hydraulic energy between surface equipment and downhole sensors and flow control valves installed in a multistage completion. A straight-pull-to-release option enables replacement of the upper completion without the need to retrieve the lower completion and with no damage to the control lines.

Simple, flexible design

The HEWM connector consists of two subassemblies: the receptacle, which is run with the lower completion, and the stinger, which is run with the upper completion.

Its concentric design eliminates the need for any alignment downhole when stinging into the lower completion following an upper completion workover. This key feature makes the connector easy and reliable to install even in highly deviated or horizontal wells.

Compatible with hydraulic and electric control lines, the HEWM connector integrates with direct hydraulic, electrohydraulic, and electric downhole control and monitoring systems.

Inductive coupler

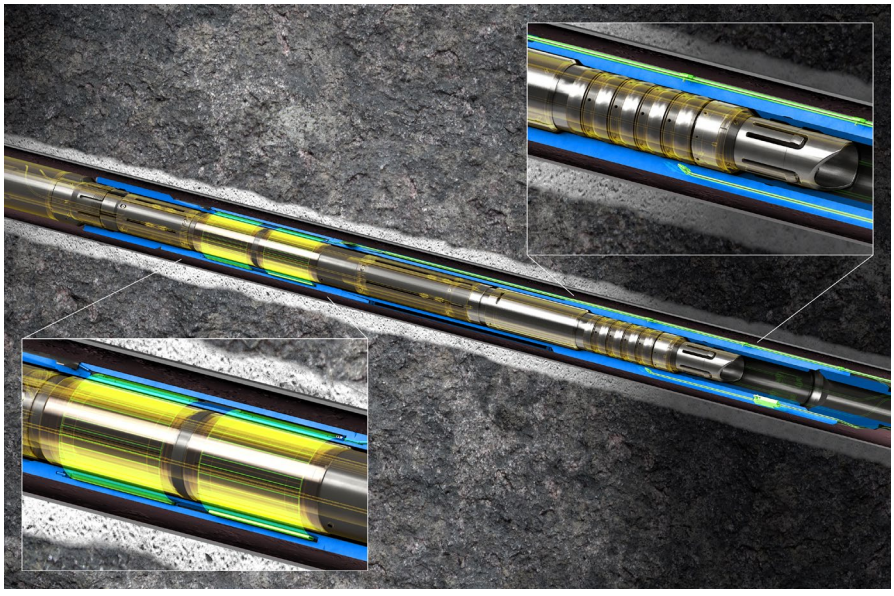
The inductive coupler is extremely robust, contains no electronics, and is constructed with full-metal integrity, offering longevity and reliability throughout the life of the well and through multiple workover operations. It enables wireless communication between two or more completion stages without any physical connection. Its fully metal-encased design protects it from fluid or gas ingress.

Power and telemetry

A single, permanent, twisted-pair electric cable provides electrical power and high-rate bidirectional telemetry. System health tags are also transmitted to surface, enabling diagnostic and prognostic system health monitoring. This telemetry also makes the system immune to ESP noise.

Workover operations

During a workover, the hydraulic ports in the receptacle are covered by a protective sleeve, preserving hydraulic integrity.



HEWM hydraulic and electric downhole wet-mate connector.

HEWM

HEWM Connector Stinger Specifications	Four Hydraulic Lines	Five Hydraulic Lines
Active flow-wetted material	4140 INCONEL® 718	INCONEL 935 INCONEL 718
Yield strength of flow-wetted material, psi [kPa]	80,000 [551,580] 120,000 [827,370]	110,000 [758,423] 120,000 [827,370]
Approximate weight, lbm [kg]	700 [317]	717 [325]
External working pressure at 302 degF [150 degC], psi [kPa]	6,000 [41,368]	10,000 [68,947]
ID, in [cm]	3.75 [9.525]	3.75 [9.525]
Min. ID, in [cm]	3.74 [9.499]	3.74 [9.499]
ID drift, in [cm]	3.603 [9.15]	3.603 [9.15]
Internal working pressure at 302 degF [150 degC], psi [kPa]	6,000 [41,368]	7,500 [51,710]
Upper thread connection		
Size, in [cm]	4.500-8RD [11.43]	4.500 [11.43]
Weight, lbm/ft [kg/m]	12.75 [18.97]	15.1 [22.47]
Type	EUE	VAM TOP®
Configuration	Box	Pin
Max. working temperature, degF [degC]	311 [155]	311 [155]
Min. working temperature, degF [degC]	40 [4.4]	40 [4.4]
Force to connect or latch, lbf [N]	7,000 [31,137]	7,000 [31,137]
Force to disconnect or unlatch, lbf [N]	20,000 [88,964]	20,000 [88,964]
Number of control lines	One ¼-in electric, four ¼-in hydraulic	One ¼-in electric, five ¼-in hydraulic
OD, in [cm]	8.369 [21.25]	8.369 [21.25]
Max. OD, in [cm]	8.379 [21.28]	8.379 [21.28]
Overall length, in [cm]	209.98 [533.34]	215 [546.1]
Makeup length, in [cm]	207.36 [526.69]	212.3 [539.24]
Tensile strength at 302 degF [150 degC], lbf [N]	150,000 [667,233]	100,000 [444,822]

HEWM Connector Receptacle Specifications	Four Hydraulic Lines	Five Hydraulic Lines
Active flow-wetted material	4140 INCONEL 718	INCONEL 935 INCONEL 718
Yield strength of flow-wetted material, psi [kPa]	80,000 [551,580] 120,000 [827,370]	110,000 [758,423] 120,000 [827,370]
Approximate weight, lbm [kg]	950 [430]	982 [445]
External working pressure at 302 degF [150 degC], psi [kPa]	6,000 [41,368]	7,500 [51,710]
ID, in [cm]	3.955 [10.045]	3.955 [10.045]
Min. ID, in [cm]	3.950 [10.033]	3.950 [10.033]
ID drift, in [cm]	3.833 [9.735]	3.833 [9.735]
Internal working pressure at 302 degF [150 degC], psi [kPa]	6,000 [41,368]	7,500 [51,710]
Lower thread connection		
Size, in [cm]	4.500-8RD [11.43]	7.000 [17.78]
Weight, lbm/ft [kg/m]	12.75 [18.97]	26 [38.69]
Type	EUE	VAM TOP
Configuration	Pin	Pin
Max. working temperature, degF [degC]	311 [155]	311 [155]
Min. working temperature, degF [degC]	40 [4.4]	40 [4.4]
OD, in [cm]	8.369 [21.25]	8.369 [21.25]
Max. OD, in [cm]	8.379 [21.28]	8.379 [21.28]
Overall length, in [cm]	183 [464.82]	187.62 [476.55]
Makeup length, in [cm]	180.3 [457.96]	184.9 [469.65]
Tensile strength at 302 degF [150 degC], lbf [N]	250,000 [1,112,055]	250,000 [1,112,055]

Inductive Coupler Specifications

Female Coupler OD, in [cm]	Female Coupler ID, in [cm]	Male Coupler ID, in [cm]	Working Temperature Rating, degF [degC]	Storage Temperature, degF [degC]	Working Pressure Rating, psi [kPa]	Test Pressure Rating, psi [kPa]	Design Life, years	Female Coupler Tensile Rating, lbf [N]	Female Coupler Compression Rating, lbf [N]	Female Coupler Min. Torque Rating, lbf.ft [N.m]
8 [20.32]	6.17 [15.67]	3.75 [9.525]	32–257 [0–125]	–40 to 122 [–40 to 50]	10,000 [68,948]	11,500 [79,290]	10	620,000 [2,686,726]	298,000 [1,610,256]	9,130 [12,379]

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