

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 1 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

Data Sheet for Cu-Mo Thickener
(TH) 3/4-33 - 3301 - 01

01	08/28/2024	Issued For Approval				
00	07/13/2024	Issued For Review				
Rev.	Date	Description	Prepared	Checked	Approved	Authorized

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	Vendor
		Date: 05/19/2024
		Page 2 of 18

Tabulation of Revised Page

Sheet	Revisions						Sheet	Revisions						
	00	01	02	03	04	05		00	01	02	03	04	05	
1	X	X					31							
2	X	X					32							
3	X	X					33							
4	X	X					34							
5	X	X					35							
6	X	X					36							
7	X	X					37							
8	X	X					38							
9	X	X					39							
10	X	X					40							
11		X					41							
12		X					42							
13		X					43							
14		X					44							
15		X					45							
16		X					46							
17		X					47							
18		X					48							
19							49							
20							50							
21							51							
22							52							
23							53							
24							54							
25							55							
26							56							
27							57							
28							58							
29							59							
30							60							

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 3 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

TABLE OF CONTENTS

1. Cu-Mo Concentrate Thickener4

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	Page 4 of 18

1. Cu-Mo Concentrate Thickener

No.	Description	Units	Value
General data			
1	Quantity (Operational+ Standby)	#	2 (2 + 0) (1 for each phase)
2	Tag No.	-	3/4-33-3301-01
3	Location (indoors/ outdoors)	-	Outdoor
4	Application Description	-	Concentrate Thickener
5	Document Application	-	For Proposal
6	Site Condition document	-	12002-D-PR-DOC-303-GNL-001
Process / Operating Conditions			
Operating Condition			
7	Solid Mineralogy	-	Copper-molybdenum Concentrate
8	Thickener unit area required	t/m ² h	0.08
9	Thickener diameter	m	30 (VTC)
10	Froth suppression spray flow rate	m ³ /h	70 (VTC)
11	Service	h/y	7680 (320 days/year)
Thickener Feed			
12	Feed solids flow rate (nominal)	tph	40.75
13	Feed solids flow rate (maximum)	tph	47.02
14	Feed slurry flow rate (nominal)	m ³ /h	173.19
15	Feed slurry flow rate (maximum)	m ³ /h	199.83
16	Slurry Density	t/m ³	1.18
17	Solid content	%(m/m)	20
18	Solid Density	t/m ³	4
19	Solid Particle size d80	µm	38
20	Slurry pH	-	10-12
21	Dilution system	-	E-Duc (VTC)
Thickener Overflow			

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 5 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

No.	Description	Units	Value
22	Overflow destination	-	Process water tank (3-33-3231-05)
23	Overflow density	t/m3	1
24	Overflow flow rate (nominal)	m3/h	192.25
25	Overflow flow rate (maximum)	m3/h	211.06
26	Overflow solids concentration	ppm	TSS<300
Thickener Underflow			
27	Underflow destination	-	Mo Rougher feed box
28	Underflow solids density	t/m3	4
29	Underflow slurry density	t/m3	1.6
30	Underflow solids flow rate (nominal)	tph	40.75
31	Underflow solids flow rate (maximum)	tph	47.02
32	Underflow slurry flowrate (nominal)	m3/h	50.94
33	Underflow slurry flowrate (maximum)	m3/h	58.77
34	Underflow solids	%	50
Flocculant Addition			
35	Flocculant addition needed	Yes/No	No
36	Flocculant dosage	g/t	-
37	Flocculent liquid rate	Lit/h	-
38	Flocculent liquid Concentration	ppm	-
Mechanical Information			
Thickener and Tank Specification			
39	Application	-	Cu-Mo conc. Dewatering
40	Thickener Type	-	High Rate, Raked, above-ground tank (VTC)
41	Tank Type	-	square or cylindrical mounted on structural supports (VTC)
42	Settle Area	m ²	706 (VTC)
43	Volume	m ³	VTS
44	Tank Diameter	m	30

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 6 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

No.	Description	Units	Value
45	Side Wall Height	m	VTs
46	Overall Height	m	VTs
47	Overflow Launder Dimension	-	VTs
48	Bottom Floor Plate Slope	Degree	VTs
49	Tank Freeboard	mm	VTs
50	Feed well Type	-	VTs
51	Feed well overall Dimension	-	VTs
52	Feed Well Plate Thickness	mm	VTs
53	Feed well Freeboard	mm	VTs
54	Empty Weight (Bottom & Shell):	kg	VTs
55	Operating Weight:	kg	VTs
56	Weight of Rake Mechanism & Lifting Device	kg	VTs
57	Froth removal system	-	Froth boom or De-Aeration tank & water spray (VTs)
58	Settling rate/Flux	-	VTs
RAKE Mechanism Data			
59	Number of Arms	pcs	4 (VTC)
60	Number of Rakes of Each Arms	pcs	2 Long + 2 Short (VTC)
61	Angle of Rakes	Degree	VTs
62	Operational Torque	N.M	VTs
63	Peak Torque	N.M	VTs
64	Design Torque	N.M	VTs
65	Rake Drive Power	Kw	VTs
66	Rake Rotation Speed	rpm	VTs
67	Rake arm Outside Dia.	m	VTs
68	Rake Arm Bottom Clearance	mm	VTs
69	No. of Blade	pcs	VTs
70	Rotating Mechanism type	-	Hydraulic (VTC)

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev	Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00
			Page 7 of 18

No.	Description	Units	Value
71	Mounting Plate (W×L×H)	mm	VTs
72	Rake Bearing	-	VTs
73	Shaft Seal	-	VTs
74	Rake Shaft (Dia. / Length)	mm	VTs
Lifting Mechanism Data			
75	Lifting Mechanism type:	-	Hydraulic (VTC)
76	Lifting Height:	mm	VTs
77	Lift Capacity:	-	VTs
78	Lift Speed:	mm/min	VTs
Material of Construction Data			
79	Shell	-	Carbon steel (VTC)
80	Bottom	-	Carbon steel (VTC)
81	Handrail	-	yes
82	Walkway	-	yes
83	Shaft	-	VTs
84	Rack mechanism	-	VTs
85	Lining	-	Rubber (VTC)
86	Shell Thickness	mm	8 (VTC)
87	Bottom Thickness	mm	12 (VTC)
88	Lining Thickness	mm	6mm (VTC)
89	Full span platform	-	Yes
RACK MECHANISM DRIVE SPECIFICATION			
90	Motor installed Power	kW	22 (VTC)
91	Motor absorbed Power	kW	VTs
92	Motor Operation	-	DOL/VFD (VTs)
93	Rotation	-	CCW/CW (VTs)
94	Gearbox Type (If applicable)	-	VTs

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 8 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

No.	Description	Units	Value
95	Gearbox Ratio (If applicable)	-	VTs
96	Gearbox output Speed (If applicable)	rpm	VTs
97	Motor & Gearbox Coupling (If applicable)	-	VTs
98	Cooling System	-	VTs
LIFTING DRIVE SPECIFICATION			
99	Motor installed Power	kW	VTs
100	Motor absorbed Power	kW	VTs
101	Motor Operation	-	DOL/VFD (VTs)
102	Rotation	-	CCW/CW (VTs)
103	Gearbox Type (If applicable)	-	VTs
104	Gearbox Ratio (If applicable)	-	VTs
105	Gearbox output Speed (If applicable)	rpm	VTs
106	Motor & Gearbox Coupling (If applicable)	-	VTs
107	Cooling System	-	VTs
HYDRAULIC POWER PACK DATA FOR RACK MECHANISM			
108	Oil Pump type	--	VTs
109	Oil pump Capacity	Liter/hr	VTs
110	Oil pump Pressure	bar	VTs
111	Total Required / installed power	kW	VTs
112	Oil tank capacity / Dimension	--	VTs
113	Oil specification	--	VTs
114	External cooling	--	Required or not (VTs) Specification: (VTs)
115	Filter	--	Required or not (VTs) Specification: (VTs)
116	Relief Valve	--	Required or not (VTs) Specification: (VTs)
117	Level Switch	--	Required or not (VTs) Specification: (VTs)
118	Pressure Switch	--	Required or not (VTs) Specification: (VTs)
119	Temperature Switch	--	Required or not (VTs)

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 9 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

No.	Description	Units	Value
			Specification: (VTS)
120	Check Valve	--	Required or not (VTS) Specification: (VTS)
121	Air Breather	--	Required or not (VTS) Specification: (VTS)
122	Drip tray	--	Required or not (VTS) Specification: (VTS)
HYDRAULIC POWER PACK DATA FOR LIFTING MECHANISM			
123	Oil Pump type	--	VTS
124	Oil pump Capacity	Liter/hr	VTS
125	Oil pump Pressure	bar	VTS
126	Total Required / installed power	kW	VTS
127	Oil tank capacity / Dimension	--	VTS
128	Oil specification	--	VTS
129	External cooling	--	Required or not (VTS) Specification: (VTS)
130	Filter	--	Required or not (VTS) Specification: (VTS)
131	Relief Valve	--	Required or not (VTS) Specification: (VTS)
132	Level Switch	--	Required (VTC) Specification: (VTS)
133	Pressure Switch	--	Required (VTC) Specification: (VTS)
134	Temperature Switch	--	Required or not (VTS) Specification: (VTS)
135	Check Valve	--	Required or not (VTS) Specification: (VTS)
136	Air Breather	--	Required or not (VTS) Specification: (VTS)
137	Drip tray	--	Required or not (VTS) Specification: (VTS)
GENERAL REQUIREMENT & ACCESSORIES			
138	Feed well		Yes
139	Overflow Launder	-	Yes
140	Feeding pipe	-	yes
141	Discharge	-	By Underflow Pumps
142	Local Control Panel & Display	-	Yes

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev	Date: 05/19/2024	
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 10 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

No.	Description	Units	Value
143	Level Switch	-	Yes
144	Level Control	-	Yes
145	Torque meter overload detector	-	Yes
146	Lifting Position Indicator	-	Yes
147	Mud level indicator	-	Yes
148	Bed pressure indicator	-	Yes
149	Others	-	VTs

Motor Data Sheet

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
1. General				
1.1	Equipment tag No		3/4-33-3301-01	
1.2	Equipment Name		Cu Concentrate Thickener	
1.3	Application Description		Concentrate Dewatering	
1.4	Quantity		1	
1.5	Equipment Supplier		AVL	
2. ELECTRICAL CHARACTERISTICS				
2.1	Cable Entry info.		Will be Informed to Vendor after contract	
2.2	Industrial Type		Heavy Duty	
2.3	Earthing System		Solidly Earthed-TN -S	
2.4	Location / Service		Outdoor	
2.5	Installation		Horizontal/Vertical	
2.6	Torque Characteristics		See Note 10	
2.7	Service Factor		1 (VTC)	
2.8	Motor Type		Squirrel Cage Induction Motor	
2.9	Manufacturer		As per Approved Vendor List (In otherwise acc. to project agreements)	
2.10	Stator Winding		6 lead (suitable for wye-delta starting)	
2.11	Winding Material (Stator/ Rotor)		Copper (See Note 8)	

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 11 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
2.12	Winding Type (Form/Random)		Form	
2.13	Duty Cycle		S1 (Continuous)	
2.14	Insulation Class / Temp. Rise		F/B (See Note 11)	
2.15	Voltage, Variations	V	400V±5%, 3ph (VTC)	
2.16	Frequency, Variations	HZ	50HZ±2% (VTC)	
2.17	Rated Current	A	By vendor	
2.18	Number of Poles		By vendor	
2.19	Power Rating (Name Plate Rating)	kW	See Note 1, Note 2	
2.20	Absorbed Power	kW	VTs	
2.21	Power Factor	%		
	@2/4 Load		VTs	
	@3/4 Load		VTs	
	@Full Load		VTs	
	Locked Rotor		VTs	
2.22	Efficiency	%	Premium Efficiency	
	Efficiency Classification (IE Code)		Min. IE3	
	@2/4 Load		VTs	
	@3/4 Load		VTs	
	@Full Load		VTs	
	Locked Rotor		VTs	
2.23	Speed	rpm		
2.24	Starting Method		☐ D.O.L ☐ VFD (See Note 3)	
2.25	Starting Current (L.R.C)	A	VTs	
2.26	Acceleration Time	Sec	VTs	
2.27	Full Load Torque	N.m	VTs	
2.28	Starting Torque	% FLT	VTs	
2.29	Max.Torque	% FLT	VTs	
2.30	Pull-Up Torque / Break Down Torque	%	VTs	
2.31	Driven load moment of inertia GD2			
	Rotor	Kg.m ²	VTs	
	Load	Kg.m ²	VTs	
2.32	Withstand Fault Current		VTs	
	Main Terminal Box	(kA) / Duration Time	VTs	

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 12 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
	Auxiliary Terminal Box	(kA) / Duration Time	VTs	
2.33	No. of Starting per Hour		(See Note 15)	
	From Cold		3 (VTC)	
	From Hot		2 (VTC)	
2.34	Time interval between two Consecutive starts			
	From Cold		VTs	
	From Hot		VTs	
2.35	Permissible locked rotor time (s)			
	@ 100% voltage		VTs	
	@ 80% voltage		VTs	
2.36	Torque-Speed Characteristics Curves (At 100% & 80% Rated Voltage)		VTs	
2.37	Current-Speed Characteristics Curves (At 100% & 80% Rated Voltage)		VTs	
2.38	Thermal Limit Curves (At 100% & 80% Rated Voltage)		VTs	
2.39	Power factor versus speed curves (At 100% & 80% Rated Voltage)		VTs	
2.40	Max Locked Rotor Current at Rated Volts (%FLA)		ACC. To IEC60034-6	
3. PROTECTION AND MEASUREMENT				
3.1	Motor Enclosure IP			
	Hazardous Area		IP65, explosion proof as per area classification (See Note 9)	
	Non-Hazardous Area		IP55 according to IEC 60034-5 (See Note 9)	
3.2	Terminal Boxes IP		IP54 or better	
3.2	PT100 / PTCs (Thermistors) For Motor Windings		A) 45KW ≤Motors ≤132KW → 3×PTC B) 132KW < Motors → 6×PT100 (See Note 5)	
3.3	PT100 for Motor Bearing		2×PT100 (See Note 5)	

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 13 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
3.4	Setpoint Data for Winding PTCs			
	Alarm	°C	VTs	
	Trip	°C	VTs	
3.5	Noise Level		Less than 85 dBA @ 1m	
3.6	Safety requirements		see note 35	
3.7	Safety Sign		see note 36	
3.8	Safety Installation and operation requirements		see note 37	
4. MECHANICAL CHARACTERISTIC				
4.1	Motor Mounting		VTs	
4.2	Enclosure/Frames		Cast Iron	
4.3	Frame Reference		VTs	
4.4	Frame Earth Bus		Required	
4.5	Cooling Method		Cooling Method For Motor: TEFC (IC411) Cooling Method For VFD Motor: (min. IC416) (See Note 6)	
4.6	Rated Power for VFD Motor's External Fan	KW	VTs □400V □ 230V	
4.7	Fan material		Non-Sparking Design/ Corrosion Resistance/ Bi-directional/ Brass/Bronze/Aluminium	
4.8	Bearing Type and Material (For DE & NDE)		Anti-Friction type VTC	
4.9	Max. Bearing Housing vibration velocity	mm/s	Acc. to IEC 60034-14	
4.10	Max. Shaft vibration Displacement	mmills p-p	Acc. to IEC 60034-14	
4.11	Bearing Life		Not less than 50,000 hours VTC (See Note 16)	
4.12	Lubricating			

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 14 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
	Grease/Oil/ Other		Grease with premium grade (For outdoor services it shall be selected based on the Minimum ambient temp.)	
	Self / Forced		Self- Lubricated	
	Grease Relief Port (For regreasable Bearings)		Required	
	Bearing Lubrication Interval (Hour)		VTs	
4.13	Power Terminal Box			
	Type		VTs	
	Cable Box Entry		ISO Metric Threaded	
	Location From DE (TOP/LHS/RHS)		(See Note 12)	
	Direction of Cable Entrance		(See Note 12)	
	Internal ground Stud		Yes	
4.14	Terminal Box for PTC/PT100 Sensors		Yes	
	Location From NDE (LHS/RHS)		VTs	
	Direction of Cable Entrance		Bottom	
4.15	Terminal Box for Space Heater		Required	
	Location From DE (LHS/RHS)		RHS	
	Direction of Cable Entrance		Bottom	
	Space Heater		230VAC	
4.16	Base Plate		VTs	
4.17	Outline Dimension	mm	VTs	

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 15 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

ITEM	Description	UNIT	PURCHASER'S REQUIREMENTS	VENDOR'S RESPONSE
4.18	Motor Weight	kg	VTS	
4.19	Lifting Eye		(See Note 13)	
4.20	Name plate		Stainless Steel	
4.21	Painting Colour		(See Note 17)	
5. Control & instrumentation				
5.1	Control panel required	Y/N	YES	
5.2	Instrument required	Y/N	YES	

Notes:

- Rated Power shall be delivered at site condition or height & temperature de-rating factor shall be considered for sizing of motor.
- Rated Power shall be calculated as bellow:

$$P = (\text{Required Mechanical power}) * (\text{API factor})$$

Required Mechanical power <22KW → API factor = 1.25
22KW ≤ Required Mechanical power <55KW → API factor = 1.15
55KW ≤ Required Mechanical power → API factor = 1.1
- For the motor starting method please refer to the related mechanical datasheet and process viewpoint. (D.O.L or V.F.D)
- All motors controlled by VFD shall be equipped with insulated bearings at both drive and non-drive ends.
- LV motors (above 8 kW controlled by VFD or where specifically is requested) shall have six (two per phase) PT100 on stator windings and two PT100 sensor for bearing.
- For motor driven by VFD and rated power above 160KW, IC416 shall be considered. For motor that feed by VFD, cooling fan shall be driven by separate motor.
- Exterior surface finish shall be the manufacturer's standard corrosion-resistant paint system.
- The rotor cage shall be made of brazed copper or copper alloy and shall be free from excessive inherent axial thrust, and shall be laminated.

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 16 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

9. Motors to be used in hazardous areas shall be totally enclosed fan cooled (TEFC), IP65, explosion proof as per area classification. On explosion proof motors, means shall be provided for withdrawing end plates and cartridges housing (where fitted) in a manner which shall avoid damage to explosion proof flanges. Motors to be used in non-hazardous area, outdoor in non-process, shall be totally enclosed fan cooled (TEFC) with degree of protection IP55 according to IEC 60034-5. In non-hazardous area, indoor in non-process area, standard industrial type motors, with degree of protection IP55 according to IEC 60034-5 shall be used.
10. Motors shall have an equivalent NEMA design B torque characteristics for normal operating conditions. For high starting torque applications motors shall have an equivalent NEMA Design C characteristic. Motors for use with VFDs shall have IEC "N" (NEMA Design B) torque characteristics, unless specifically noted otherwise. Motor-driven equipment with a torque curve varying as the square of the speed shall, as a minimum, have a starting torque complying with design "N" as per IEC 60034-12. Motor-driven equipment with a constant torque shall, as a minimum, have a starting torque complying with design "H" as per IEC 60034-12.
11. in case of Using VFD Insulation class of windings shall be class H with temperature rise limited to the temperature of class B insulation, according to IEC standard.
12. Motors shall have terminal boxes suitable for accepting cables from any of the four directions at right angles in the plane of the terminal box. Main terminal box shall be positioned on the right-hand side when viewed from the driving end.
13. All motors shall have forged lifting eyes or lugs. Motors above 20kg weight shall be provided with lifting lugs or hooks or in special cases, lifting equipment set.
14. Installation, Operation & Maintenance Instruction, Dimensional Outline Drawing, Certified Test Report & Written Statement shall be prepared by Vendor.
15. Motors shall be designed for at least the number of direct on line starts per hour as specified in the IEC Standards. Motors with the capability of at least 5 starts per hour, direct on line, are preferred. Bidders shall include starts per hour information for all motors in the proposal, and include in motor protection.
16. Bearing life, in belt drive applications, with loading in accordance with the data provided, shall be rated for 50,000 hours and 100,000 hours for direct drive applications.

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 17 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

17. Finishing paint shall be RAL7032 or manufacturer's standard and in accordance with the painting schedule which shall be prepared by manufacturer and shall be sent to the buyer for approval.
18. Vendor shall provide and issue the important data required to design the related structure / foundation.
19. The vendor should use ASME B16.5 nozzle flange standard Tie in/Out points and ASME B16.47B for sizes larger than 26 inches.
20. The type, SCH, rating and standard of flanges must be specified.
21. The size of the nozzles must be mentioned in inch unit.
22. NDE: Non-Drive End
23. DOL: Direct On-Line
24. V: Vertical Mounted
25. RHS: Right Hand Side
26. H: Horizontal Mounted
27. LRC: Locked Rotor Current
28. API: American Petroleum Institute
29. TEFC: Totally Enclosed Fan Cooled
30. FLT: Full Load Torque
31. VFD: Variable Frequency Drive
32. VTS: Vendor to Specify
33. VTC: Vendor to Confirm
34. Suitable de rating for the motors needs to be applied due to site elevation.
35. Regarding the safety requirements, refer to the MSDS document with document number 12002-D-SF-DSH-303-GNL-021 and follow it.
36. The Safety Sign & Escape Route Layout for Dewatering Building document number 12002-D-SF-LAY-303-DWT-140 shall be referred to and followed.
37. MAINTENANCE & INSTALLATION & OPERATION safety requirements should be specified by the vendor.
38. Supplier shall provide all of documents, such as: general arrangement (GA), etc.
39. Standard of nozzles must be according to ASME B16.5 & B16.47.
40. For Orientation & direction of nozzles, shall be approved with Piping department of client.

	Document Number: 12002-D-ME-DSH-303-FLO-291	Rev		Date: 05/19/2024
Class: FA	Library Code: 303-E03-3301-00-ME-DSH-291-01	Client	Vendor	Page 18 of 18
	Document Title: Data Sheet for Cu-Mo Thickener (TH) 3/4-33 - 3301 - 01	01	00	

41.Design 3D model in PDMS (version 12.1).