

Copper Select® for Premium Threaded Connections

There is no margin for error on critical components used in the Oil and Gas Industry. SIFCO Applied Surface Concepts (ASC) is the world leader in selective plating technology and sets the standard for quality and reliability for plating copper onto premium threaded connections.

SIFCO ASC has received approved vendor status from Tenaris and VAM, the leading licensors for oil field thread design. This approved status qualifies SIFCO ASC to train operators, worldwide, to selectively apply copper onto premium threaded connections. SIFCO ASC certified operators are also available to plate your connections.

PLATING OPTIONS

- ▶ Become a Copper Select® Licensee and plate your connections
- ▶ Take advantage of SIFCO ASC's certified Job Shop plating services

GETTING STARTED

- ▶ Sign license agreement
- ▶ Purchase SIFCO ASC Copper Select® equipment
- ▶ Obtain qualification connections
- ▶ Complete SIFCO ASC Copper Select® Training
- ▶ Submit qualification samples for evaluation

The Copper Select® license agreement is a 3-year term. The licensee must either have the necessary SIFCO ASC equipment or agree to purchase from SIFCO ASC the equipment and supplies required to carry out selective plating of premium threaded connections using Copper Select® technology and meet the requirements of the specification. The licensee must complete a one-week training program and submit qualification samples as required.

SIFCO ASC will provide technical support and will periodically audit the Copper Select® licensee's plating process. Operators will be required to re-qualify prior to the end of the 3-year period to ensure the highest quality standards are maintained.

REV 2/19

ADVANTAGES

- ▶ Quality copper deposits
- ▶ Consistently accurate thickness control
- ▶ Tenaris & VAM qualified



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TRAINING AND QUALIFICATION OVERVIEW

- ▶ Five-day classroom & hands-on training
- ▶ Written examination
- ▶ Practical evaluation
- ▶ Qualification samples
- ▶ Metallographic analysis
- ▶ Qualification card

GETTING STARTED

Copper Select® Qualification is contingent upon completion of the following:

- ▶ Licensee must own or agree to purchase a complete SIFCO Process® Copper Select® system from SIFCO ASC
- ▶ Licensee must purchase selective plating consumables and Copper Select replacement parts from SIFCO ASC
- ▶ Practical evaluation
- ▶ Qualification samples
- ▶ Metallographic analysis
- ▶ Qualification card

COMPREHENSIVE TRAINING PROGRAM

The Copper Select® Qualification Program consists of a combination of classroom and hands on training. It is followed by the preparation of samples for submission and evaluation to SIFCO ASC and the Thread Licensor in accordance with their specification.

Upon completion of the 5-day program, the trainee will have a solid understanding of the SIFCO Process® of Selective Plating and Copper Select® technology and procedures for depositing copper onto premium threaded connections that meet the requirements of the Thread Licensor. SIFCO ASC will witness the Licensee's preparation of the necessary qualification samples for evaluation by SIFCO ASC and the Thread Licensor. Class size is limited to 2 trainees per Copper Select® workstation and a maximum of 5 trainees.

The trainee will demonstrate their knowledge and ability in 3 ways:

- ▶ Pass a written examination upon completion of the classroom portion of the training.
- ▶ Demonstrate the ability to successfully plate copper onto premium threaded connections in accordance with the Copper Select® Procedures.
- ▶ Produce qualification samples that meet the quality requirements of the Thread Licensor.

TRAINING DETAILS

DAY 1

Classroom - AM/PM

- ▶ Introduction
- ▶ SIFCO Process®
 - ▶ Safety
 - ▶ Solutions – handling, storage, shelf life
 - ▶ Tooling, anodes, cover materials, cleaning, maintenance and storage
 - ▶ Auxiliary equipment
 - ▶ Power packs
 - ▶ Solutions – preparatory, preplate and plating
 - ▶ Evaluating deposits

DAY 2

Classroom - AM

- ▶ SIFCO Process®
 - ▶ Calculations and formulas
 - ▶ Base material and identification
 - ▶ Preparatory instructions
 - ▶ Preplate operation
 - ▶ Understanding technical data sheets
- ▶ Theory of plating on threads

Classroom - PM

- ▶ Thread Licenser Specifications
- ▶ Copper Select®
 - ▶ Procedures
 - ▶ Rinsing
 - ▶ Stripping
 - ▶ Equipment
 - ▶ Anode selection
 - ▶ Quality tests
 - ▶ Documentation and record keeping

DAY 3

Classroom - AM

- ▶ Brief review
- ▶ Copper Select®
 - ▶ Planning and documentation of a job

Hands On - PM

- ▶ Practical
 - ▶ Set up & plate practice connection ends 1, 2 & 3
 - ▶ Record keeping
 - ▶ Quality inspection
 - ▶ Adhesion
 - ▶ Thickness testing

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TRAINING DETAILS CONTINUED

DAY 4

Classroom - AM

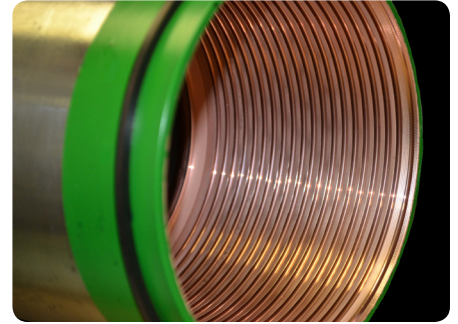
- ▶ Written examination

Hands On - PM

- ▶ Trainees set up and plate practice connection end 4

SIFCO ASC Observation

- ▶ Trainees set up and plate SIFCO ASC qualification coupling ends 1 and 2



DAY 5

SIFCO ASC Observation and Audit

- ▶ Licensee set up and plate qualification parts
 - ▶ Upon successful quality evaluation of SIFCO ASC coupling, Licensee will be instructed to send the final qualification coupons to the Thread Licensor
- ▶ Licensee prepare and ship qualification coupling and documentation
 - ▶ SIFCO ASC qualification couplings for immediate shipment for evaluation
 - ▶ Thread Licensor qualification coupling for shipment to Licensor upon notice of qualification by SIFCO ASC
 - ▶ Summary review

AFTER COMPLETION OF THE TRAINING AND QUALIFICATION PROGRAM

Within 10 business days, SIFCO ASC will submit a report to the Thread Licensor that includes:

- ▶ List of trainees
- ▶ Copy of graded written examinations
- ▶ Summary report of the qualification training
- ▶ Current status of Licensee

Within 21 business days after the receipt of qualification couplings, SIFCO ASC will submit a report on the results of the Quality Examination of the Licensees Qualification Coupling with a qualification recommendation to the Thread Licensor. If there is a favorable recommendation, the Licensee will be instructed to send qualification coupling to the Thread Licensor, accompanied by the Qualification Form.

In the event of an unfavorable recommendation resulting from the SIFCO ASC evaluation, SIFCO ASC and the Licensee will review the evaluation results, determine a root cause and mutually agree on a course of action prior to sending the qualification coupling to the Thread Licensor.

Upon approval of the qualification of the Licensee Operator by the Thread Licensor, SIFCO ASC will provide the Licensee Operator a Qualification Card.

COPPER SELECT EQUIPMENT

1	61150244	SP 150-24-400-3 Power Pack
1	60352050	Lead Positive Red 150 Amp, 3m (9.8 ft.)
1	60352055	Lead Negative Black 150 Amp, 3m (9.8 ft.)
7	12302150	Handle, 150 Amp
6	13002038	Anode Graphite ID-38F - Preparatory Anode for 2 3/8" and 2 7/8"
6	13PREP02	Copper Select Preparatory Anode for 3 1/2 to 5" connector
1	13PREP03	Copper Select Nickel Anode for 4 1/2 to 5" connector
6	13PREP04	Copper Select Preparatory Anode for 5 1/2 to 7 3/4" connector
1	13PREP05	Copper Select Nickel Anode for 7 to 7 3/4" connector
6	13PREP06	Copper Select Preparatory Anode for 8 5/8" and larger connections
1	PLAT2375	Copper Select plating anode for 2 3/8" connector
1	PLAT2875	Copper Select plating anode for 2 7/8" connector
1	PLAT3500	Copper Select plating anode for 3 1/2" connector
1	PLAT4000	Copper Select plating anode for 4" connector
1	PLAT4500	Copper Select plating anode for 4 1/2" connector
1	PLAT5000	Copper Select plating anode for 5" connector
1	PLAT5500	Copper Select plating anode for 5 1/2" connector
1	PLAT6625	Copper Select plating anode for 6 5/8" connector
1	PLAT7000	Copper Select plating anode for 7" connector
1	PLAT7625	Copper Select plating anode for 7 5/8" and 7 3/4" connectors
1	PLAT8625	Copper Select plating anode for 8 5/8" connector
1	PLAT9625	Copper Select plating anode for 9 5/8" and 9 7/8" connectors
1	PLAT10750	Copper Select plating anode for 10 3/4" connector
1	PLAT11750	Copper Select plating anode for 11 3/4" and 11 7/8" connectors
1	PLAT13375	Copper Select plating anode for 13 3/8" and 13 5/8" connectors
1	PLAT14000	Copper Select plating anode for 14" connector
1	10901040	10" Filter Elements
4	11601300	1" AeroNiki [®] Tape
2	11903038	Jacket ID-38C (5/pk) Only required if using ID-38F Anode
1	11000300	Model L Submersible Pump 115V
3	12800090	Nitrile Gloves
1	12600010	Scissors
5	40101280	4 liter bottle for used solutions
6	11600050	Tape Aluminum 50.8 mm x 54.8 m (2 in. x 60 yds.)
1	12000150	CS Jacket Material
1	11801150	56 P Sleeving
3	63000300	Red TuffWrap 46 cm x 3 m (18 in. x 10 ft.)
1	62602200	Canoe Clips

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COPPER SELECT EQUIPMENT CONTINUED

6	11401000	Submersible Pump Pan, Small 371 mm x 318 mm x 140 mm H (12 1/2 in. x 14 5/8 in. x 5 1/2in. H)
6	11500100	1000 ml Squeeze Bottle
1	10905500	Flow System, M-150 115VAC
1	10905000	Flow System, M-75 115VAC
2	11603050	Adhesion Test Tape
1	62801100	Disposable Gloves 100/pk
8	12004580	Closed cell Neoprene 1" thick (sq. ft.)
8	25700050	PVC Sheet .032 (sq. ft.)
8	12004581	Foam Sheet 2" thick (sq. ft.)
1	80101036	Electrocleaning, 20 L
1	80102136	Etching & Activating, 20 L
1	80102336	Etching & Desmutting, 20 L
1	80102436	Etching & Activating, 20 L
1	80208036	Nickel Acid, 20 L
2	80528036	Copper, Heavy Build, Alkaline, 20 L
1	FMP 10	Deltascope FMP 10
1	FGAB1.3	FGAB1.3 Probe
1	FGABI1.3-150	FGABI 1.3 - 150 Probe
1	90009202	Copper Select Coupling Standard
1	90009203	Re-calibrate the standard