

4 BALL LUBRICANT TESTERS

19900-2 SETA-SHELL 4-BALL EP LUBRICANT TESTER WITH AUTOLOAD SYSTEM

ASTM D2596; D2783; IP 239; IP 300 Procedure A & B (obs); EN ISO 20623; ISO CD 11008; CEC L-45-T-93; (ASTM D2266 & D4172 when used with Wear Loading Kit 19940-0)

- Applied loads range 40 to 800kgF
- Drive speed from 720 to 1900rpm
- Timer range 0.1s to 9999hr
- Torque measurement and limiting
- Full Digital Control
- Digital displays of Applied Load, torque, time
- Safety/splash guard

Determines the friction properties of extreme pressure oils and greases. Used in tribology research laboratories and in the routine quality control of finished lubrication products.

A ball, mounted in a chuck, is rotated against three stationary balls in a pot containing the sample lubricant. The digital speed controller has four programmable presets, three are factory pre-programmed with the most commonly used speeds. A load, adjustable in the range of 40 to 800kgF, is applied to the balls via a balance beam and electric jack. The applied load is displayed on a digital readout. The torque transferred between the rotating and stationary balls is measured and displayed. The digital timer, with a range of 0.1 second to 9999 hours, can be used to control the duration of the test. If the torque exceeds a preset level, or the balls weld during a test power to the drive motor is automatically turned off.

The optional Seta 19940-0 Wear Loading Kit allows the user to quickly convert the equipment into a Four Ball Wear Tester for ASTM D2266 and D4172 tests.

SUPPLIED WITH: 1200 test balls to DIN 5401 and instruction manual.



19900-2



CALIBRATION & VERIFICATION MATERIALS



SETPPLUS EXTENDED WARRANTY AVAILABLE



TECHNICAL DATASHEETS AVAILABLE

ACCESSORIES - 4 Ball Lubricant Testers

REQUIRED - Elevated Temperatures (ASTM D2266, D4172)

- 19840-0 SETA HEATING PAD AND CONNECTING LEAD
 19850-3 SETA TEMPERATURE CONTROLLER INDICATOR, for 19840-0.
Voltage: 110/120V or 220/240V, 50/60Hz (switchable)
 19860-0 SETA THERMOCOUPLE, for torque arm on standard Seta 19800-5 and also for Rolling and Sliding Contact Torque Arm 19810-0. One required for each torque arm used.

REQUIRED - Viscosity Shear Stability (CEC L-45-T-93)

- 19820-0 SHEAR STABILITY HEAD, comprises tapered roller bearing and jacket.
 19830-3 SETA TEMPERATURE CONTROL SYSTEM, for use with 19820-0, comprises a circulating water bath with fittings for heating and cooling, and a digital indicator.
Voltage: 110/120V, 50/60Hz
 220/240V, 50/60Hz

Note: CEC Reference Fluids available, see Calibration Verification & Training.

Note: Other items which may be required include: Pitting detector, Accelerometer and Time Lapse Recorder (For IP300 only); Solvents.

ACCESSORIES - Cont'd

REQUIRED - Wear (ASTM D2266, D4172) (19900-2 Only)

- 19940-0 WEAR LOADING KIT, for ASTM D2266 and D4172. Comprises a manual lever arm and weight holder. Supplied with 8 cast iron weights (3 x 1kg, 1 x 500g, 4 x 100g).

OPTIONAL

- 19750-2 MITUTOYO MICROSCOPE, for x/y linear measurement. Allows direct viewing of ball scar with x30 magnification.
Voltage: 110/120V or 220/240V, 50/60Hz (switchable)
 19870-0 SETA RACK, to hold 120 used balls, prior to wear scar examination.
 19895-0 ASTM TEST BALLS, pack of 500 (D2596, D2783, D2266, D4172).
 19890-0 SETA TORQUE WRENCH, with socket, set for 50ft.lbf (68Nm). Used for tightening the lock-nut on the ball-holder.
 19920-0 TRANSFORMER, for use with 110V, 50/60Hz power supply.
 19910-0 CHART RECORDER, (19900-2 only), single channel, 0 to 10V input for continuous torque recording.
 99320-2 SETA ULTRASONIC CLEANING BATH, (for details see page 142).
 45002-0 SETPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

- 19930-0 LOAD VERIFICATION KIT (19900-2 only)

19800-6 SETA-SHELL 4 BALL LUBRICANT TESTER

ASTM D2596; D2266; D2783; D4172; IP 239; IP 300 Procedure A & B (obs); EN ISO 20623; ISO CD 11008; CEC L-45-T-93

- Applied load range 0 to 800kgF
- Drive speed from 720 to 1900rpm
- Digital speed control with four presets
- Timer range 0.1s to 9999hr
- Automatic shut off on seizure
- Safety/splash guard

Similar to 19900-2, but with the load applied to the balls via a balance beam and set of calibrated weights.

As on the 19900-2, the digital speed controller has four programmable presets, three are pre-programmed to the most commonly used speeds. Duration of the test can be controlled by the digital timer, which has four ranges and spans 0.1 second to 9999 hours. If the balls weld during a test, the power to the drive motor is automatically turned off, via a torque sensing mechanism.

SUPPLIED WITH: a set of 17 cast-iron weights on trolley (6 x 5kg, 3 x 2kg, 3 x 1kg, 1 x 500g, 4 x 100g), 1200 test balls (DIN 5401) and instruction manual.



CALIBRATION & VERIFICATION MATERIALS



SETAPLUS EXTENDED WARRANTY AVAILABLE



TECHNICAL DATASHEETS AVAILABLE



19820-0 Shear Stability Head



19800-6



TEST PARAMETERS						
	ASTM D2596	ASTM D2783	ASTM D2266	ASTM D4172	IP239	CEC L-45-T-93
Speed (rpm)	1770 ± 60	1760 ± 40	1200 ± 50	1200 ± 60	1450 to 1500	1475 ± 25
Test Temp (°C)	-	18 to 35°C	75 ± 1.7°C	75 ± 2°C		60 ± 1°C
Time	10 ± 0.2 secs	10 ± 0.2 secs	60 ± 1 min	60 ± 1 min	10 ± 0.2 secs or 60 ± 0.5 secs or 1 hour	4, 8 and 20 hours
Load (kgF)	6 to 800	6 to 800	40 ± 0.2	15 or 40 ± 0.2	6 to 800	510 ± 20
Measurement	Load Wear Index + Weld Point	Load Wear Index + Weld Point	Scar diameter	Scar diameter	Weld Load (WL) Mean Hertz Load (MHL) Scar Diameter (MSWD) Seizure Load (ISL)	
Product	Lubricating Grease	Lubricating Fluids	Lubricating Grease	Lubricating Fluids	Lubricating Oils	Lubricating Oils (Polymer)

SPECIFICATIONS		
Seta Part No:	19900-2	19800-6
Speed Range:	720 to 1900rev/min	720 to 1900rev/min
Load Range:	40 to 800kg	0 to 800kg
Timing:	0.1s to 9999hr	0.1s to 9999hr
Voltage:	220/240V, 50/60Hz	220/240V, 50/60Hz
Power:	1.5kW	1.5kW
Size (HxWxD):	169 x 63 x 62cm	169 x 82 x 62cm
Weight:	150kg	161kg

CONSUMABLES - 4 Ball Lubricant Testers

2 Years/2000 Tests		Qty
19800-002	TEST BALLS, DIN 5401, Pack of 1200	8
19800-024	THRUST RACE - PLUNGER HEAD	1
19800-025	THRUST RACE - BEARING HEAD	1
19800-036	BALL CHUCK	3
19910-001	CHART ROLLS (19900-2 with 19910-0 fitted only)	1