Stand-Cote®

The fluorocarbon-coated bolt that outperforms ordinary bolts.

• Reduced friction • Predictably uniform loading
• Superior chemical resistance • May often be reused

Stand-Cote bolts provide increased service, economy and safety, even in corrosive atmospheres which would drastically reduce the life of ordinary bolts. Extensive laboratory testing and 5 years of field use have proven that Stand-Cote SC-1 outlasts galvanized, cadmium-plated, aluminized and molybdenum-disulphide-coated fasteners through a temperature range of −400° to +500° F and in a wide variety of environments. In many ways, Stand-Cote may match or exceed the long-life corrosion resistance of stainless steel, at a considerably reduced cost, while retaining the higher strength of alloy steel.

Stand-Cote's ceramic-filled, baked-on PTFE fluorocarbon resin coating includes a permanent lubricant which inhibits galling of threads on the bolt. This enables Stand-Cote to maintain a low coefficient of friction in both make-up and break-out operations.

The protective SC-1 coating resists hydrogen embrittlement and is generally unaffected by the chemical conditions found in most oilfield services and chemical plants. (See Table 2 and photos on pages 3 and 4). Make-up and break-out time are drastically reduced (by 50 to 60%), and Stand-Cote bolts can usually be removed with standard hand tools. This makes Stand-Cote the ideal choice in situations where torch-cutting is prohibited.

The unique ability to perform predictably and uniformly over a wide range of conditions distinguishes the Stand-Cote bolt from all others.

Table 1 **Physical Properties of Stand-Cote SC-1 Fluoropolymer Coating**

Property	Units	Values
Tensile strength	psi	2,000-4,000
Elongation	%	35-50
Water absorption	%	0.3
Service temperature		
Continuous	°F	500
Short time	°F	575
Dielectric strength	v/mil	1,200-2,000
Chemical resistance		Good
Adhesion		Excellent
Coefficient of friction		0.05-0.10

Stand-Cote SC-1 Coefficient of Friction

C_f is a much misunderstood term and depends upon many factors including pressure, speed and temperature. Friction of SC-1 coatings is relatively constant over a range of increasing pressure from .2 psi to 100,000 psi and from liquid hydrogen (−420° F) temperatures to +500° F. As load increases, the coefficient of friction increases but remains well below other dry film lubricants.

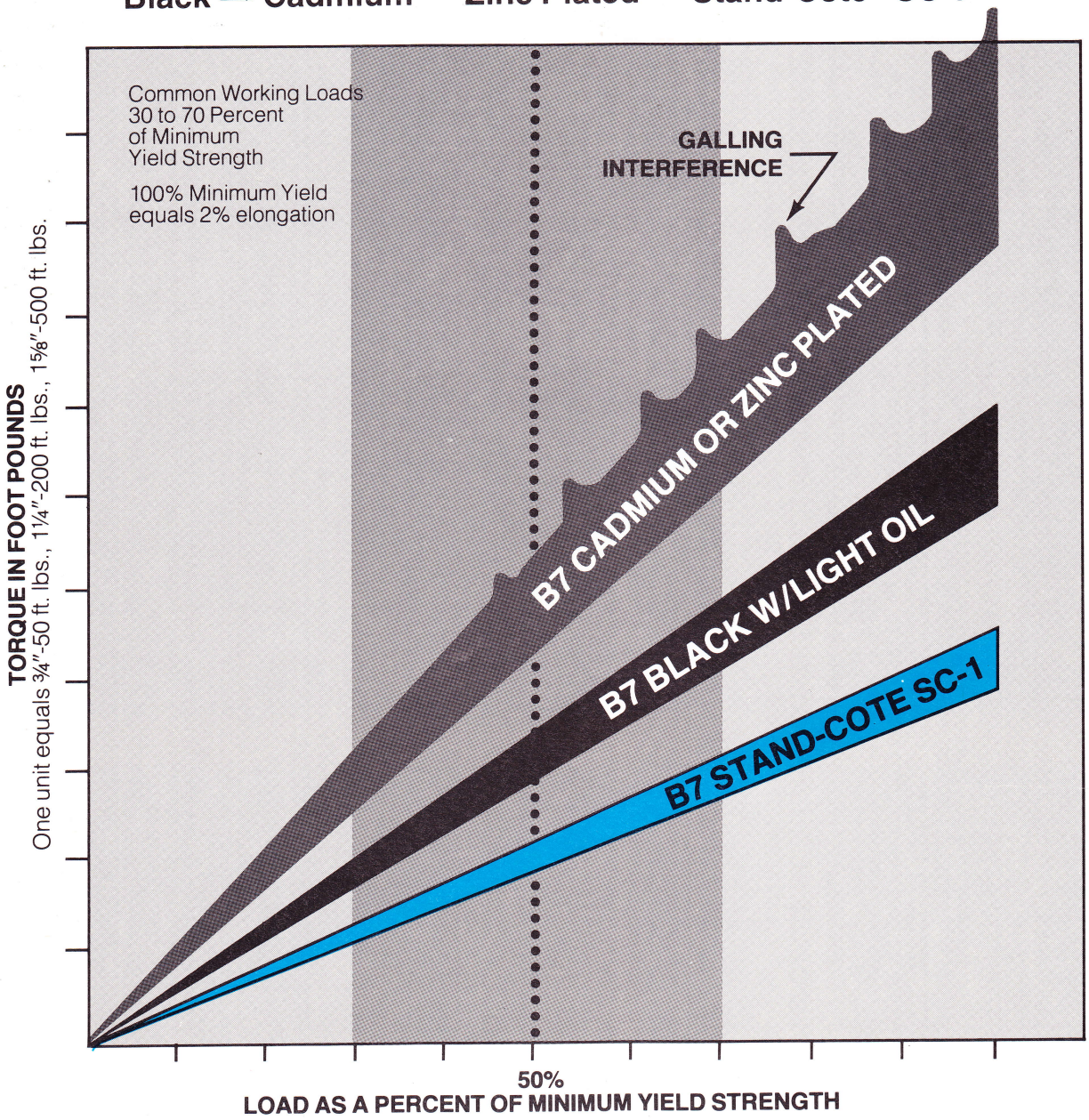
Stick-slip (chatter) is virtually non-existent. It is this ability to perform uniformly over a wide range of conditions that distinguishes these coatings from other dry film lubricants.

Table 2 **General Characteristics of Polymeric Binder**

Strong Acids	Good	Sunlight	Excellent
Strong Alkalies	Poor	Heat	750° F
Grease & Oils	Excellent	Cold	−420° F
Organic Solvents	Excellent	Flammability	Self Extinguishing
Water	Excellent		

TORQUE TO LOAD SCHEMATIC

B7 Bolts (A-193) Minimum Yield Strength 105,000 PSI
Black — Cadmium — Zinc Plated — Stand-Cote® SC-1



Range of Expected Torque (Ft. Lbs.) to Obtain Tensile Load (Lbs.) 50% of Minimum Yield Strength*

Standard ASTM A-193 B7 all thread stud bolts with two A-194 2H nuts

Bolt Dia.	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝
Thread Form	13UNC	11UNC	10UNC	9UNC	8UNC	8UNC	8UNC	8UNC	8UNC	8UNC
Tensile Load (1)	7,455	11,865	17,535	24,255	31,815	41,475	52,500	64,732	78,350	93,450
SC1 Torque Range Ft. Lbs. (2)	32 to 40	40 to 48	100 to 110	145 to 155	240 to 275	350 to 400	400 to 450	660 to 720	850 to 925	950 to 1050
Black Torque Range Ft. Lbs.	55 to 80	80 to 120	180 to 230	250 to 310	400 to 475	540 to 640	750 to 850	1150 to 1275	1350 to 1500	1550 to 1750

(1) Tensile stress load equal to one-half minimum yield of bolts. In critical applications, it is advisable to determine accurately the actual stress on the bolt in the particular situation.

(2) Values for torquing diameters of bolts coated with Stand-Cote® SC-1 fluoropolymer sizes ½" to 1" are for hand wrenches. If hydraulic wrenches are used, torque requirement will be 15 to 20% less. Values for diameters 1⅛" and larger are for hydraulic wrenches. If hand wrenches are used, the torque requirement will be 15 to 20% higher. Continued application of torque by power wrenches does not cause this increased load with black or plated bolts.

* Data is prepared from records of actual tests using both hand wrenches and hydraulic wrenches with tensile load measured electronically by load cells and Stand-Torque® Force Washers.

Tensile load data was prepared by F.J. Allen, Jr., Consulting Petroleum Engineer,