



StopGap Expandable Liner (SEL)

The SEL® has been designed to temporarily case off short sections of holes (typically ranging from 50 to 750 ft.) with no loss of hole size. Unlike conventional casing and liner, SEL® is designed to be run through the previous casing then expanded across the problem zone.

Once the SEL® has been expanded, cemented and drilled out the problem zone will be isolated with a cement sheath, therefore normal drilling may resume with no loss of hole size.

After SEL® deployment the hole section is cased off by steel reinforced by fiber cement where steel covers approximately the 80% of the area.

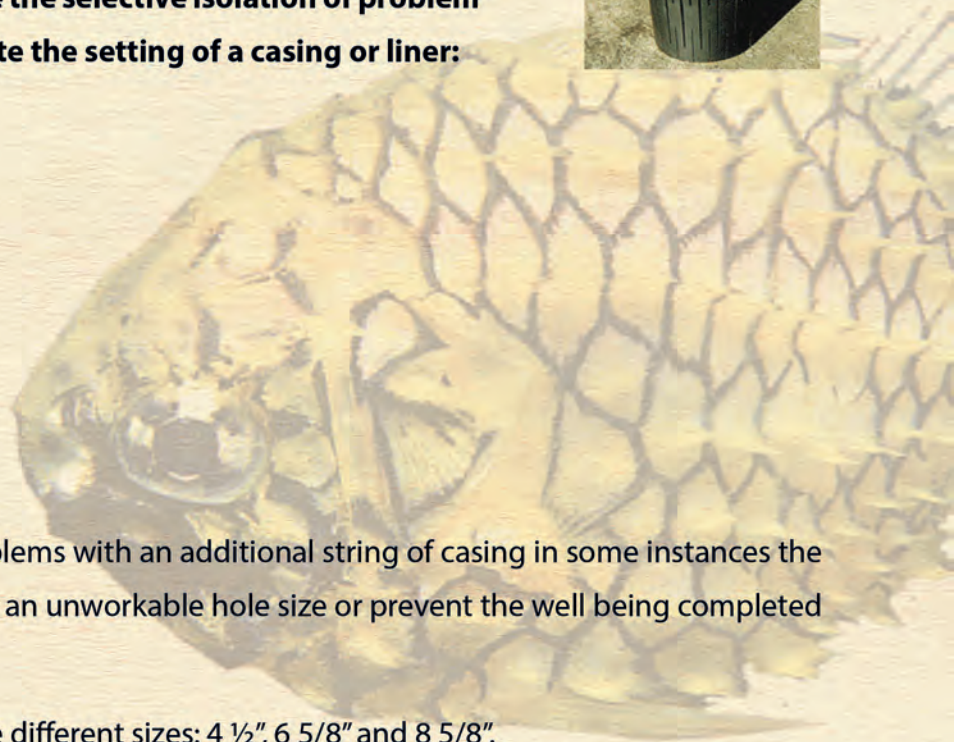
Typical applications for the SEL® are the selective isolation of problem zones which would otherwise dictate the setting of a casing or liner:

- Unstable holes
- Rubble zones
- Sloughing shales
- Loss zones
- Faults
- Over-pressured formations
- Depleted formations
- Incomplete casing runs

By solving the above mentioned problems with an additional string of casing in some instances the associated telescoping could result in an unworkable hole size or prevent the well being completed with the optimum completion.

The SEL® is currently available in three different sizes: 4 ½", 6 5/8" and 8 5/8".

- 4 ½" SEL® expands to 7" casing size.
- 6 5/8" SEL® expands to 9 5/8" and 10 ¾" casing size.
- 8 5/8" SEL® expands to 11 ¾" and 13 3/8" casing size.





There are essentially two ways of using an SEL®:

- 1- It can be a planned operation, therefore included in the Drilling Program (preferred method).
- 2- It can be called-off to solve an unexpected drilling problem.

Only when the SEL® is a planned operation it is possible to tieback the SEL® into the casing above.

In fact, if the casing has been run with an oversize shoe it is possible to set the top of the SEL® inside the shoe joint and still retain the same ID. of the casing after expansion. For example, tie back is possible if the previous casing has been run with an oversize/tieback shoe.

ALTERNATIVE BOREHOLE LINER	4 ½" SEL®		6 5/8" SEL®		8 5/8" SEL®	
Geometrical Characteristics	inches		inches		inches	
OUTSIDE DIAMETER	4.5		6.625		8.625	
INSIDE DIAMETER	4.028		6.065		7.98	
WALL THICKNESS	0.236		0.28		0.323	
CONNECTORS DIAMETER	4.902		7.39		9.626	
CONNECTORS O.D.	0.437		0.662		0.823	
MAKE UP LOSS	3		3		3	
NOMINAL WEIGHT	11.00 lbs/ft		20.00 lbs/ft		29.00 lbs/ft	
INTERNAL CAPACITY	8.22 liters/m		18.64 litres/m		32.27 litres/m	
METAL DISPLACEMENT	2.04 litres/m		3.64 litres/m		5.43 litres/m	
METAL DISPLACEMENT	0.00391 bbl/ft		0.00691 bbl/m		0.0104 bbl/ft	
Mechanical Characteristics : SEL® Joints & Connections						
SEL® JOINT MATERIAL	Alloy Steel	API 5L B	Alloy Steel	API 5L B	Alloy Steel	API 5L B
*STEEL COMPRESSION STRENGTH (Tested)	64,936	lbs	136,435	lbs	242,555	lbs
*STEEL COMPRESSION BUCKLING FAILURE (Tested)	57,442	lbs	96,250	lbs	TBA	lbs
*STEEL YIELD STRENGTH (Theoretical)	82,394	lbs	150,961	lbs	204,582	lbs
*ULTIMATE TENSILE FAILURE (Theoretical)	141,247	lbs	251,602	lbs	340,970	lbs
Mechanical Characteristics : SEL® Top Connectors						
TOP CONNECTOR MATERIAL	316 L		316 L		316 L	
*STEEL YIELD STRENGTH (Theoretical)	56,858	lbs	104,838	lbs	204,582	lbs
*ULTIMATE TENSILE FAILURE (Theoretical)	159,203	lbs	251,602	lbs	340,970	lbs
	64-PUM-85 yellow polyurethane		64-PUM-85 yellow polyurethane		64-PUM-85 yellow polyurethane	
INTERNAL COATING MATERIAL TEMPERATURE	115°C		115°C		115°C	
	64-PUM-126 black polyurethane		64-PUM-126 black polyurethane		64-PUM-126 black polyurethane	
INTERNAL COATING MATERIAL TEMPERATURE	160°C		160°C		160°C	