

REMEMBER TO S.T.A.M.P. BEFORE YOU SEAL!!

Think of the procedure you follow when attempting to order a sealing solution for a particular application. Have your hands automatically started to gravitate towards your head, searching for the clumps of hair to begin tugging at? Taking it a step further, does your company even have a procedure in place for you to follow? Often times the answer is a resounding "No!" and this most often leads to spikes in blood pressure as well as unique hair-loss patterns. Fortunately for you, these times of stress and confusion have come to an end thanks to **S.T.A.M.P.**! This guideline has been established and provides five specific criteria regarding your sealing solution and its' application.

S.T.A.M.P.

Speed - What is the speed under which the seal will be required to perform? This speed could be represented as **RPM** (Rotations Per Minute), **FPM** (Feet Per Minute), or **MPS** (Meters Per Second).

Temperature - What are the minimum and maximum temperatures the seal will be exposed to in the application? This could be given by degrees in either Celsius or Fahrenheit.

Application - Where is the seal being used? What is the seal function? This refers to the equipment in which the seal is being installed as well as what the function is of the seal in the application.

Medium - What is the media? This is referring to the lubricant or viscous material that is to be sealed or excluded. Are there compatibility considerations? Examples of possible media are grease, oil, hydraulic fluid, water, etc.

Pressure - What are the minimum and maximum pressures the seal will be exposed to in the application or environment? This could be designated in either **PSI** (Pounds per square inch) or **BARS** (1 BAR is equal to roughly 14.5 psi).

After you have determined the **S.T.A.M.P.** criteria, the next step is determining the dimensions for your seal. These values could be given in two different methods; either the actual **SEAL** dimensions **OR** the **STEEL** dimensions, i.e. the **shaft, bore and groove** dimensions. The vast majority of seal suppliers prefer that the dimensions provided are the steel dimensions, since it is sometimes difficult to measure the actual seal inner diameter. For replacement seals, the steel dimensions are usually found on the rubber outer case portion of the seal. There are three key measurements that must be described:

- **Inner Diameter** – This is the shaft diameter.
- **Outer Diameter** - This is the diameter of the bore.
- **Width** - This is the groove height.

*To see an illustrated example of what these dimensions are referencing please download our "Application Data Sheet" free of charge at

http://www.colonialseal.com/fileCabinet/Oil_Seal_Application_Data_Form.pdf

Once your seal supplier has this **S.T.A.M.P.** information, an appropriate style of seal must be determined. There are many styles of seals to choose from depending on the application, however, there are six standard style profiles for seals. They are normally designated by their ISO descriptions: A, AS, B, BS, C and CS. For additional information on these standard styles, as well as other styles, please refer to the Colonial Seal Co. profile chart.

The final step in the designing phase of your seal selection is to determine which case/spring and lip materials are suitable for your application. What type of steel is to be used in the seal outer case, inner case, and (if applicable) the spring? Does the application dictate an all rubber covered seal or a metal-cased seal? What is the lip material required for your application? Depending on compatibility, these materials range from standard NBR (Nitrile Butadiene Rubber) to high performance materials such as Viton, Teflon, Silicone, and Urethane.

With the **S.T.A.M.P.** guideline answers, feel free to breathe a sigh of relief the next time you are assigned the task of finding a particular sealing solution. Whether the seal is an industry standard part or a custom design for your unique application, rest assured that you will be able to provide the proper solution thanks to **S.T.A.M.P.**! For any additional information or to request a quote please visit our website at www.colonialseal.com/contactus.html.

*To find the charts and tables referenced above please refer to the 3rd page of this article or to the attached .pdf file, depending on the method you are using to view this article.

Feel free to access our “Chemical Compatibility Chart” for a full 16 page listing of different types of media at http://www.colonialseal.com/Media_Chart.pdf.

Material Specifications

Material	Advantages	Disadvantages	Ranges	Substitutes
Nitrile (NBR)	Highly cost efficient. Good low temp. capabilities. Excellent wear resistance. Little to no swell in hydrocarbon fluids.	Poor high heat resistance Poor ozone resistance. Poor resistance to lubricants containing sulfur or EP additives, hydrocarbons or oxygenate blends (gasoline/methanol).	-40°F to +248°F -40°C to +120°C	FPM Polyacrylate PTFE
Viton® (FPM)	Excellent properties for sealing under high temperatures. Excellent fluid compatibility. Very long usage life	Poor resistance to basic fluids with pH>7. Expensive compared to other materials.	-22°F to +392°F	PTFE
Leather	Good dry running capabilities	Higher cost than Nitrile. Poor heat resistance.	-50°F to +200°F -46°C to +93°C	Nitrile FPM Polyacrylate PTFE
Polyacrylate (ACM)	Good resistance to EP lubricants. Low swelling when sealing hydrocarbon fluids. Better heat resistance than Nitrile.	Higher cost than Nitrile. Poor low temp. compatibility. Should not be used when sealing aqueous media.	-20°F to +300°F -29°C to +149°C	FPM PTFE
Silicone	Good resistance to dry heat. Excellent sealing capabilities in low temp. applications.	Higher cost than Nitrile. High swell properties. Poor dry running compatibility. Poor resistance to some EP additives.	-80°F to +350°F -62°C to +176°C	FPM PTFE
Urethane	Good lubricant and ozone resistance. Good abrasion resistance. More durable than Silicone.	Substantial softening when used in applications above 250°F. Poor resistance to hot water or steam.	Please contact your Harwal representative with your specific application.	Urethane cannot be substituted.
Teflon® (PTFE)	Superior dry running combatibility. Extremely low coefficient of friction. Excellent chemical resistance. Resistant to hydrocarbon/oxygenate blends.	Poor resistance to abrasion in dry environments. Can be easily damaged during installation. High thermal expansion.	-100°F to +450°F -73°C to +232°C	PTFE cannot be substituted.

Seal Type Interchange

Colonial Seal Styles	A	AS	B	BS	C	CS	VA	VB	VC	KA	KB	KC
Chicago Rawhide	HMS4	CRWA6	CRW1	CRWA1	CRWH1	CRWAH1	HMH1	HM14	N/A	N/A	HMA1	N/A
JIS	SC	TC	SB	TB	SA2	TA2	VA	VB	VC	KA2	KB	KC
National	35	32	48	47	45	41	N/A	N/A	34	N/A	KB49	N/A
Freudenberg	BA	BA SL	B1	B1 SL	B2	B2 SL	N/A	B1 OF	BA OF	N/A	N/A	N/A

RPM to FPM Conversion Chart

Shaft Size in Inches

RPM	1/2"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"
100	13	26	52	79	105	131	157	183	209	236	262
250	33	65	131	196	262	327	393	458	523	589	654
500	65	131	262	393	523	654	785	916	1047	1178	1308
750	98	196	393	589	785	981	1178	1374	1570	1766	1963
1000	131	262	523	785	1047	1308	1570	1832	2093	2355	2617
1250	164	327	654	981	1308	1635	1963	2290	2617	2944	3271
1500	196	393	785	1178	1570	1963	2355	2748	3140	3533	3925
1750	229	458	916	1374	1832	2290	2748	3205	3663	4121	4579
2000	262	523	1047	1570	2093	2617	3140	3663	4187	4710	5233
2250	294	589	1178	1766	2355	2944	3533	4121	4710	5299	5888
2500	327	654	1308	1963	2617	3271	3925	4579	5233	5888	6542
2750	360	720	1439	2159	2878	3598	4318	5037	5757	6476	7196
3000	393	785	1570	2355	3140	3925	4710	5495	6280	7065	7850
3250	425	850	1701	2551	3402	4252	5103	5953	6803	7654	8504
3500	458	916	1832	2748	3663	4579	5495	6411	7327	8243	9158
3750	491	981	1963	2944	3925	4906	5888	6869	7850	8831	9813
4000	523	1047	2093	3140	4187	5233	6280	7327	8373	9420	10467
4250	556	1112	2224	3336	4448	5560	6673	7785	8897	10009	11121
4500	589	1178	2355	3533	4710	5888	7065	8243	9420	10598	11775
4750	621	1243	2486	3729	4972	6215	7458	8700	9943	11186	12429
5000	654	1308	2617	3925	5233	6542	7850	9158	10467	11775	13083

FPM VALUES

Standard Seal Profiles

