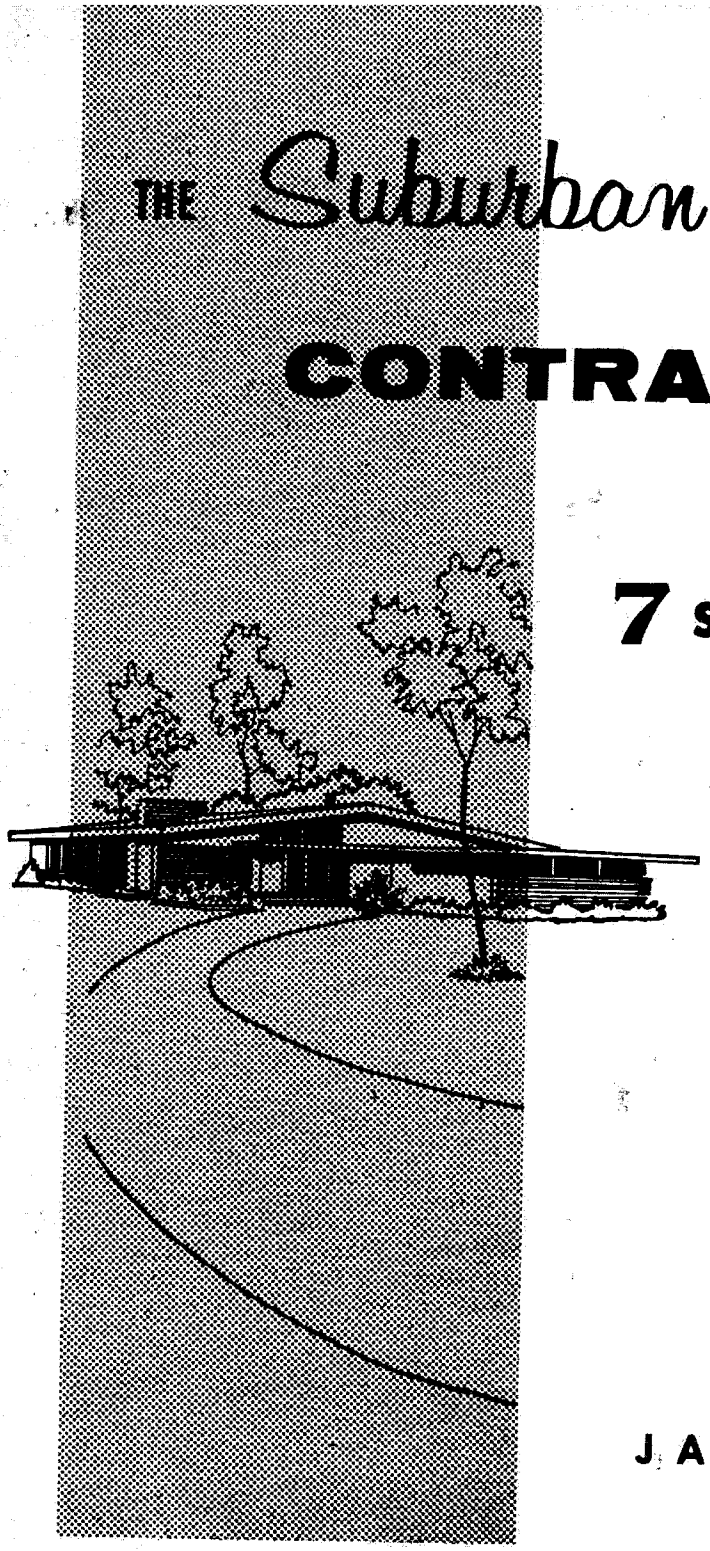
# THE Suburban CONTRACTOR



## 7 STAR ✶ NEWS ON

- Heating
- Cooling
- Repairs
- Plumbing
- Hydronics
- Technical
- Sanitation

JANUARY 1962


BULK RATE
U.S. POSTAGE
PAID
LIVONIA, MICH.
PERMIT NO. 95

# LOVE ME — LOVE MY SEAL

by Z. Margossian
R.L. DEPPMANN COMPANY

One of the largest contributing factors to the growth of the Hydronic Industry occured years ago with the introduction of circulating pumps into the old gravity systems. The use of circulating pumps enabled larger buildings such as apartments, schools, churches and factories to go to hot water as a means of distributing comfort. Yet, this very same circulator, today causes some of the most aggravating service problems in the industry it helped develop. One of the prime problems in Hydronics today is seal failure in the pump, and ironically it is not the fault of the pump or the seal.

Seal failures occuring within the first two years of operation in a closed Hydronic System are usually due to one or more of the following conditions:

1. Excessive dirt, sand and oxides.
2. Excessive or improper water treatment.
3. Pump Cavitation (improper pump selection).
4. Air
5. Excessive temperatures.
6. Pumps run without fluid.

The function of a pump seal prevents any fluid leakage by having two matched, optically flat or mated faces, one stationary and one that rotates with the pump shaft. The average heating-cooling system seal uses a carbon ring rotating against a hard material. The most popular of hard materials, in order of preference are cast iron, ceramic and tungsten carbide. The carbon ring always shows the greatest amount of wear, it being the softer of the two.

A new system installation will be better if cleaned to remove pipe dope, slushing compounds, cutting oils, welding slag, sand and other extraneous materials that find their way into the system during construction. Many commercial boiler cleaning compounds are satisfactory, providing they are adequately flushed out. Trisodium phosphate, sodium carbonate and many of the commercial detergents are also satisfactory. Following the cleaning and flushing the system should be definately neutral. To assure this, enough of the cleaning material can be added after refilling to give a PH reading between 7.5 and 9.

Hydronic systems are sometimes treated for corrosion prevention with chromates. It has been found from field experience, as well as from laboratory tests reported by one of the largest seal manufacturers in the United States, that seal wear is definately proportional to the chromate concentration in the system. Well-known national water treatment organizations tell us that adequate protection for closed water systems can be obtained with a maximum of 250-300 PPM of chromates. This level is also compatible with good seal operation and life.

Treatments which raise the causticity of the system above a PH of 9 can cause the ceramic portion of the seal to be subject to an etching action. If, because of dissolved oxygen the PH has to be increased to 11.0 or over to be effective, systems which contain non-ferrous materials such as brass, copper, bronze and aluminum will be damaged due to an electolytic reaction.

*(Continued on Page 5)*

*Continued from Page 4*

A properly designed closed system needs little or no treatment. Where water losses become so great that the term "Closed System" no longer applies, the wise water treatment consultant will refer his client to a good contractor to correct the system deficiencies.

When a pump has been selected, then later the system is altered in a way that reduces the head requirements, or an error was made in computing the original head requirements, the pump, by not fitting the job, may operate at such a low head that cavitation occurs. This is usually quite noticeable as noises or rattling in the pump casing. This vibration causes premature seal failures as well as bearing failures. An identical condition occurs when the fluid being pumped flashes into vapor in the pump casing because pressure at the pump suction is below vaporization pressure at the temperature of the pumped fluid. This last situation can be remedied by either raising the static (system) pressure or by relocating the pump relative to the expansion tank.

The quickest way to destroy any pump seal is to run the pump without fluid. With no fluid in the pump, the seal has no way to dissipate the developed frictional head and is without benefit on the fluid for a lubricant. A mechanical seal is dependent on both. The most frequent failure of this type occurs because the pump is started for electrical checkout before any fluid is placed in the system. A pump allowed to run for just a few minutes without fluid will have a damaged seal, and a premature failure is likely within the early months of operation.

Seal failures in all systems usually occur because simple, fundamental procedures are overlooked. The system should be considered as a whole to determine the cause of seal failure. Let's not merely look for an pinpoint problems in the pump. Help protect the pump that helped Hydronics.