

# Gasket & Seal Material Test Conducted On TVT Green Oil Additive

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## Abstract

Under normal conditions and recommended concentration of TVT Green Oil Additive in lubrication oils, there are no observed changes in the gasket materials including Neoprene™, Viton™, Teflon™, Buna-N (nitrile rubber) and Ethylene Propylene Rubber (EPR). This study consists of a six month observation of these materials exposed to TVT Green Oil Additive under normal temperatures of 35° F and 105° F.

## Introduction

TVT Green Oil Additive is a synthetic oil based anti-friction and anti-wear additive that is soluble in standard oil lubricants. This study is to observe the effects of TVT Green Oil Additive on a variety of elastomeric gasket materials used in industry and commercial processes.

In this paper, the time-dependent chemical degradation of several materials is studied at normal temperatures between 35° F and 105° F.

## Experiments

Based on the popular use of several sealing materials, we selected the following gasket and o-ring materials:

- Neoprene™
- Viton™
- Teflon™
- Buna-N (nitrile rubber)
- Ethylene propylene rubber (EPR)

We tested these materials over a six month period (180-days) at normal temperatures between 35° F and 105° F in two different test batches. The first test batch was left soaking in a solution of 10% TVT Green Oil Additive with 90% base oil. The second test batch was prepared at 100% TVT Green Oil Additive and no base oil to accelerate the effects (if any) on the gasket materials.

After the test period, the chemical degradation of several materials was assessed by direct observation. Observation consisted of measuring changes in the surface of materials or the infusion or absorption of oil in the sealing materials.

## Results and Discussions

The results show that there was no significant weight loss or weight gain with the exposure time. The optical observation reveals that on the surface conditions of the samples there were no changes from initially smooth to rough (surface roughness) or cracks appearance and crack propagation. Changes that would have occurred due to de-crosslinking and chain scission in the backbone of the samples or the absorption of oil due to exposure to the environment over time were not observed.

We are not aware of any surface chemistry changes as an indication of chemical degradation.

## Conclusion

Both of the above tests represent an accelerated test procedure compared to normal use of TVT Green Oil Additive due to the fact that it is only recommended as a 3% additive in most of the normal applications including several machines, small engines, diesel engines, gear boxes, automobiles, wind mills, etc. And, up to 6% TVT Green Oil Additive is recommended in other heavy duty applications such as racing vehicles, heavy duty machinery, high performance motorcycles, etc.

There is no indication of any deterioration on any of the above tested gasket materials and we recommend the use of TVT Green Oil Additive in any applications where these types of materials are used for sealing function in gaskets or o-rings.



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