

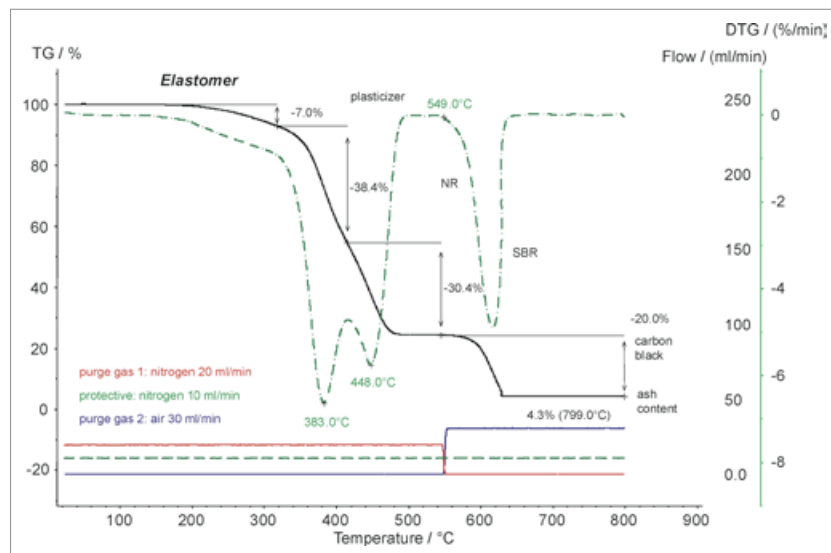
# APPLICATION SHEET

POLYMERS – POLYMER MANUFACTURING

## DECOMPOSITION BEHAVIOR OF A RUBBER MIXTURE

Aside from a few natural product impurities, natural rubber (NR) is essentially a polymer of isoprene units, a hydrocarbon diene monomer. Synthetic rubber can be made as a polymer of isoprene or various other monomers. Styrene-

Butadiene (SBR) is an elastomeric copolymer consisting of styrene and butadiene. It has a good abrasion resistance and good aging stability. SBR is stable in mineral oils, fats, aliphatic, aromatic and chlorinated hydrocarbons.



### Results

The results for the temperature-dependent mass loss of a rubber mixture are depicted in the figure. The black closed line represents the relative mass loss; the dashed green line its first derivative (DTG). At 550°C, the purge gas was changed from nitrogen to air indicated by the red and green line, respectively. Several mass loss steps are detected indicating the release of volatiles such as additives (plasticizers) and several polymer compounds up to 550°C. After the gas change, both the pyrolytic carbon and the added carbon react with the oxygen to form CO<sub>2</sub>. Its release is determined as a mass loss step. The residual mass represents the ash content (4.3%).

### Instrument

TG 209 **F3 Iris**®

### Test Conditions

Temperature range	RT ... 800°C
Heating rate	10 K/min
Atmosphere to 550°C	Nitrogen at 30 ml/min
Sample mass	14.85 mg
Crucible	Aluminum Oxide
Atmosphere to 800°C	air at 30 ml/min