## AUTOMOTIVE INDUSTRY
## Molding, light-colored

## Gasket and O-Ring
## AKTISIL Q versus carbon black N-550
### 60 Shore A, AEM, diamine cure
### according to PSA S22 5106

| | Control | AKTISIL Q | |
|---|---|---|---|
| | | 20 phr R. W 759 cure system | 30 phr E. T810T |
| Guide formulations of HOFFMANN MINERAL | M 621.7/1 | M 621.8/8 | M 621.8/9 |
| Vamac Ultra IP | 100.00 | 100.00 | 100.00 |
| Luvomaxx CDPA | 2.00 | 2.00 | 2.00 |
| Stearic acid | 1.50 | 1.50 | 1.50 |
| Vanfre VAM | 1.50 | 1.50 | 1.50 |
| Crodamide ER | 1.00 | 1.00 | 1.00 |
| FEF N-550 | 50.00 | --- | --- |
| AKTISIL Q | --- | 125.00 | 125.00 |
| Aminotriethoxysilane (AMEO) | --- | 0.63 | 0.63 |
| Rhenosin W 759 | 10.00 | 20.00 | --- |
| Edenol T810T | --- | --- | 20.00 |
| Diak No. 1 | 1.50 | 1.50 | 1.50 |
| Luvomaxx DBU DL 70 | 2.57 | 2.57 | 2.57 |
| Total phr | 170.07 | 255.70 | 255.70 |

Along with positive cost aspects, **replacing N-550 by AKTISIL Q** in combination with various possibilities of optimation results in good initial mechanical properties along with a good compression set, good heat resistance and markedly improved engine oil resistance (esp. reduced hardness change and reduced volume increase).

| | | | | | |
|---|---|---|---|---|---|
| **Mooney Viscosity** | | | | | |
| ML (1+4) 120°C | DIN 53523, T3 | MU | 33 | 23 | 25 |
| **Mooney Scorch** | | | | | |
| ML (5 MU) 120°C | DIN 53523, T4 | min | 6.9 | 6.6 | 6.0 |
| **Rotorless curemeter, 180°C** | | | | | |
| Mmin | DIN 53529, T3 | Nm | 0.03 | 0.01 | 0.01 |
| Mmax | DIN 53529, T3 | Nm | 0.51 | 0.52 | 0.53 |
| Cure rate | DIN 53529, T3 | Nm/min | 0.38 | 0.47 | 0.47 |
| $t_5$ | DIN 53529, T3 | min | 0.35 | 0.42 | 0.40 |
| $t_{10}$ | DIN 53529, T3 | min | 0.42 | 0.49 | 0.46 |
| $t_{90}$ | DIN 53529, T3 | min | 2.6 | 2.5 | 2.6 |


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| | | | Control | AKTISIL Q | | |
|---|---|---|---|---|---|---|
| | | | | 20 phr R. W 759 cure system | 30 phr E. T810T | |
| | | | M 621.7/1 | M 621.8/8 | M 621.8/9 | |
| **Physical properties** | | | | | | |
| **Press cure 10 min @ 180°C** | | | | | | |
| Density | DIN EN ISO 1183-1 | g/cm³ | 1.20 | 1.42 | 1.42 | |
| | | | | | | **PSA S22 5106** |
| **Post cure 4 h @ 185°C** | | | | | | |
| Hardness (piled S2) | DIN ISO 48-4 | Shore A | 66 | 57 | 57 | 50-80 |
| Tensile strength | DIN 53504, S2 | MPa | 16 | 8.1 | 8.1 | ≥ 7 |
| Elongation at break | DIN 53504, S2 | % | 270 | 257 | 252 | ≥ 200 |
| Rebound | DIN 53512 | % | 43 | 44 | 42 | |
| Compression set | DIN ISO 815-1, B | | | | | |
| 72 h @ 165°C, 25 % deflection | | % | 21 | 18 | 15 | ≤ 25 |
| **Air aging, 168 h @ 165°C (post cured specimen)** | | | | | | |
| Hardness (piled S2) | | Shore A | 65 | 62 | 59 | |
| Tensile strength | | MPa | 16 | 9,2 | 9,3 | |
| Elongation at break | | % | 271 | 210 | 187 | ≥ 150 |
| Modulus 100 % | | MPa | 5.2 | 4.4 | 5.3 | |
| Rebound | | % | 38 | 40 | 38 | |
| Δ Hardness | | Shore A | +4 | +5 | +2 | ≤ +10 |
| Δ Tensile strength | | % | -1 | 15 | 14 | ≤ -20 |
| Δ Elongation at break | | %, rel. | 0 | -18 | -26 | ≤ -30 |
| Δ Modulus 100 % | | % | +10 | +21 | +19 | |
| Δ Rebound | | %, rel. | -12 | -9 | -10 | |
| **Immersion in oil, OS 206 304, 168 h @ 165°C (post cured specimen)** | | | | | | |
| Hardness (piled S2) | | Shore A | 57 | 55 | 57 | |
| Tensile strength | | MPa | 16 | 10 | 10 | |
| Elongation at break | | % | 227 | 213 | 213 | ≥ 150 |
| Modulus 100 % | | MPa | 5.6 | 4.5 | 5.0 | |
| Δ Hardness | | Shore A | -9 | -2 | 0 | ±5 |
| Δ Tensile strength | | % | -4 | +23 | +25 | ≤ -20 |
| Δ Elongation at break | | %, rel. | -16 | -17 | -16 | ≤ -30 |
| Δ Modulus 100 % | | % | +19 | +24 | +12 | |
| Δ Volume | | % | +14 | +8 | +6 | -5 / +10 |

***More information on this topic:***

Aktisil Q in AEM Seals and Gaskets





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