

Detailed Specifications Polymeric Composite Material Test Samples

A. Required Base materials and Fillers with their Size

| Matric | Fillers in Nano Size only |
|--------------|-----------------------------|
| HTV-SiR | Boron nitride (BN) |
| EPDM | Silicon carbide (SIC) |
| HTV-SiR/EPMD | |
| HTV-SiR | Silica |
| HTV-SiR | Silica and zinc oxide |
| HTV-SiR | Silica and silicon nitride |
| HTV-SiR | Silica and titanium carbide |

1- Pure Samples

| Material | (weight %) | Dimension | Sample required |
|----------|------------|--------------------|-----------------|
| HTV-SiR | 100 | 10 cm*10 cm*0.2 cm | 02 |
| EPDM | 100 | 10 cm*10 cm*0.2 cm | 02 |

2- Different concentration of boron nitride (BN) nano fillers in EPDM

| Matrix | Fillers by weight | Sample required |
|--------|-------------------|-----------------|
| EPDM | BN (Nano) | |
| EPDM | 1 | 01 |
| EPDM | 3 | 01 |
| EPDM | 5 | 01 |

3- Different concentration of silicon carbide (SIC) nano fillers in EPDM

| Matrix | Fillers by weight | Sample required |
|--------|-------------------|-----------------|
| EPDM | SIC (Nano) | |
| EPDM | 1 | 01 |
| EPDM | 3 | 01 |
| EPDM | 5 | 01 |

4- Different concentration of boron nitride (BN) nano fillers in HTV-SiR

| Matrix | Fillers by weight | Sample required |
|---------|-------------------|-----------------|
| HTV-SiR | BN (Nano) | |
| HTV-SiR | 1 | 01 |
| HTV-SiR | 3 | 01 |
| HTV-SiR | 5 | 01 |

5- Different concentration of silicon carbide (SIC) nano fillers in HTV-SiR

| Matrix | Fillers by weight | Sample required |
|---------|-------------------|-----------------|
| HTV-SiR | SIC (Nano) | |
| HTV-SiR | 1 | 01 |
| HTV-SiR | 3 | 01 |
| HTV-SiR | 5 | 01 |

Detailed Specifications Polymeric Composite Material Test Samples

6- Blend Samples

| Blend Name | SiR (weight %) | EPDM (weight %) | Sample required |
|--------------|----------------|-----------------|-----------------|
| HTV-SiR/EPDM | 50 | 50 | 02 |

7- Different concentration of boron nitride (BN) nano fillers in HTV-SiR/EPDM (50%/50%)

| Matrix (blend) | Fillers by weight | Sample required |
|----------------|-------------------|-----------------|
| HTV-SiR/ EPDM | BN (Nano) | |
| 50%/50% | 1 | 01 |
| 50%/50% | 3 | 01 |
| 50%/50% | 5 | 01 |

8- Different concentration of silicon carbide (SiC) nano fillers in HTV-SiR/EPDM (50%/50%)

| Matrix (blend) | Fillers by weight | Sample required |
|----------------|-------------------|-----------------|
| HTV-SiR/ EPDM | SiC (Nano) | |
| 50%/50% | 1 | 01 |
| 50%/50% | 3 | 01 |
| 50%/50% | 5 | 01 |

9- Different concentration of silica nano fillers in HTV-SiR.

| HTV-SiR | Filler concentration | Sample required |
|---------|-------------------------|-----------------|
| 100 % | Unfilled SiR, no filler | 01 |
| 99 % | 1 % SiO ₂ | 01 |
| 98 % | 2 % SiO ₂ | 01 |
| 96 % | 4 % SiO ₂ | 01 |

10- Different concentration of silica and zinc oxide nano fillers in HTV-SiR

| HTV-SiR | Filler concentration | Sample required |
|---------|---|-----------------|
| 100 % | Unfilled SiR, no filler | 01 |
| 98.8 % | 1 % SiO ₂ + 0.2 % zinc oxide | 01 |
| 97.8 % | 2 % SiO ₂ + 0.2% zinc oxide | 01 |
| 95.8 % | 4 % SiO ₂ + 0.4 % zinc oxide | 01 |
| 99 % | 1 % zinc oxide | 01 |

Detailed Specifications Polymeric Composite Material Test Samples

11- Different concentration of silica and silicon nitride fillers in HTV-SiR

| HTV-SiR | Filler concentration | Sample required |
|---------|--|-----------------|
| 100 % | Unfilled SiR, no filler | 01 |
| 98.8 % | 1 % SiO ₂ + 0.2 % silicon nitride | 01 |
| 97.8 % | 2 % SiO ₂ + 0.2 % silicon nitride | 01 |
| 95.8 % | 4 % SiO ₂ + 0.2 % silicon nitride | 01 |
| 99 % | 1 % silicon nitride | 01 |

12- Different concentration of silica and Titanium carbide nano fillers in HTV-SiR

| HTV-SiR | Filler concentration | Sample required |
|---------|---|-----------------|
| 100 % | Unfilled SiR, no filler | 01 |
| 98.8 % | 1 % SiO ₂ + 0.2 % Titanium carbide | 01 |
| 97.8 % | 2 % SiO ₂ + 0.2 % Titanium carbide | 01 |
| 95.8 % | 4 % SiO ₂ + 0.2 % Titanium carbide | 01 |
| 99 % | 1 % Titanium carbide | 01 |
| 97 % | 3 % Titanium carbide | 01 |