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Supplementary information

Mechanical properties of magnetorheological shear thickening fluid and its application in dampers

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Figure S1. The on-site photos of the MCR 302 rheometer, the temperature control device and magnetic field device.

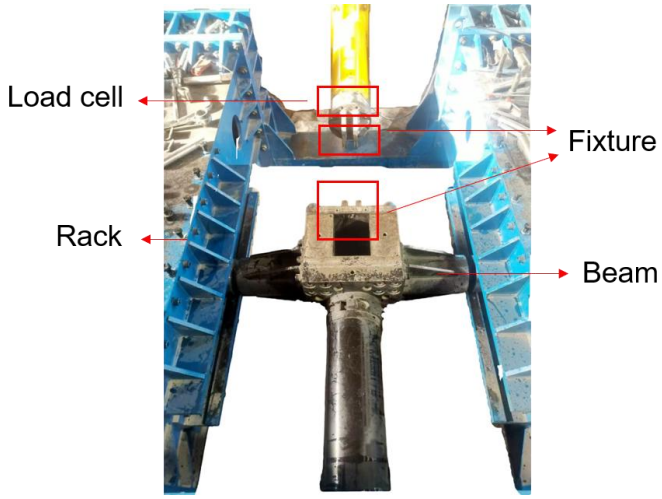

Figure S2. The on-site photo of the test device of the mechanical properties.

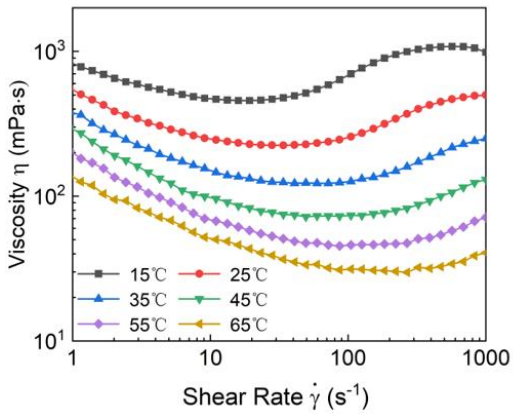

Figure S3. The curves of viscosity versus shear rate under different temperatures of MRSTF (SiO_2: 54 wt.%, CIP: 20 vol.%). MRSTF: magnetorheological shear thickening fluid.

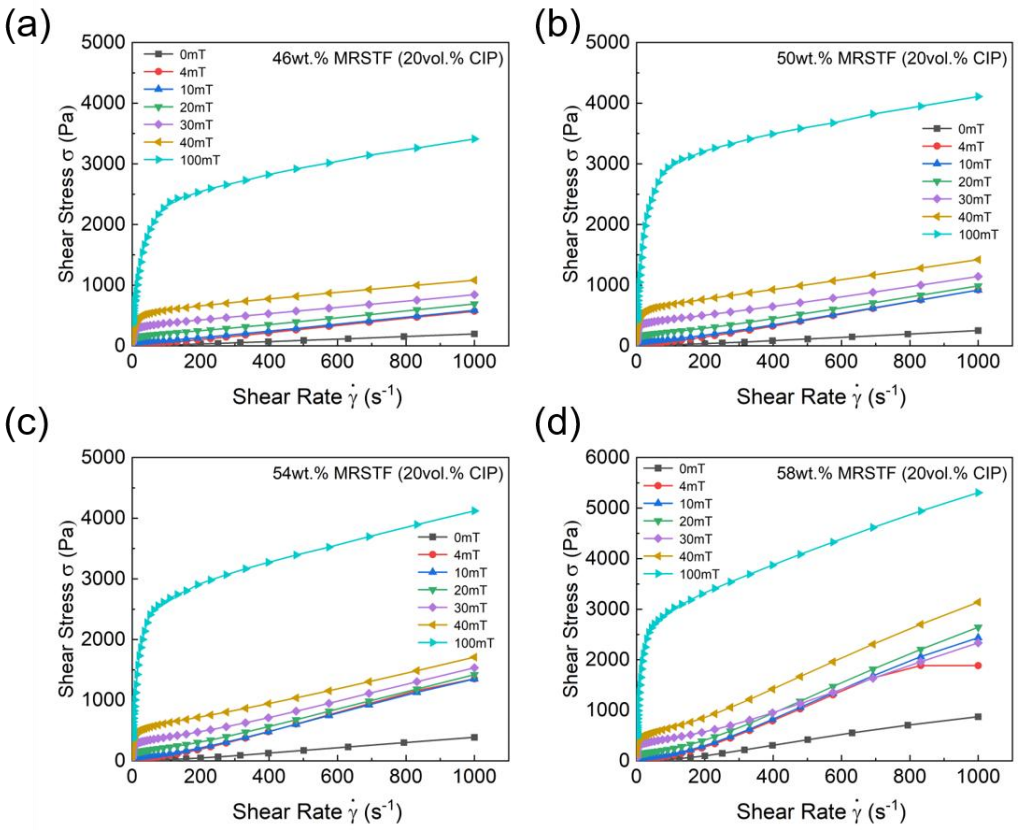

Figure S4. The curves of shear stress versus shear rate of different SiO_2 mass fractions of MRSTF (20 vol.% CIP) under different magnetic field strengths: (a) 46 wt.%, (b) 50 wt.%, (c) 54 wt.% and (d) 58 wt.%. MRSTF: magnetorheological shear thickening fluid; CIP: carbonyl iron powder.

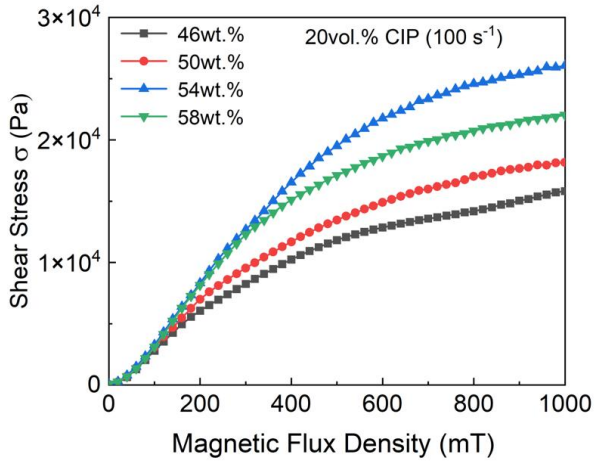

Figure S5. The curves of shear stress versus magnetic flux density of MRSTF (20 vol.% CIP) with different SiO_2 mass fractions under 100 s^{-1}. MRSTF: magnetorheological shear thickening fluid; CIP: carbonyl iron powder.

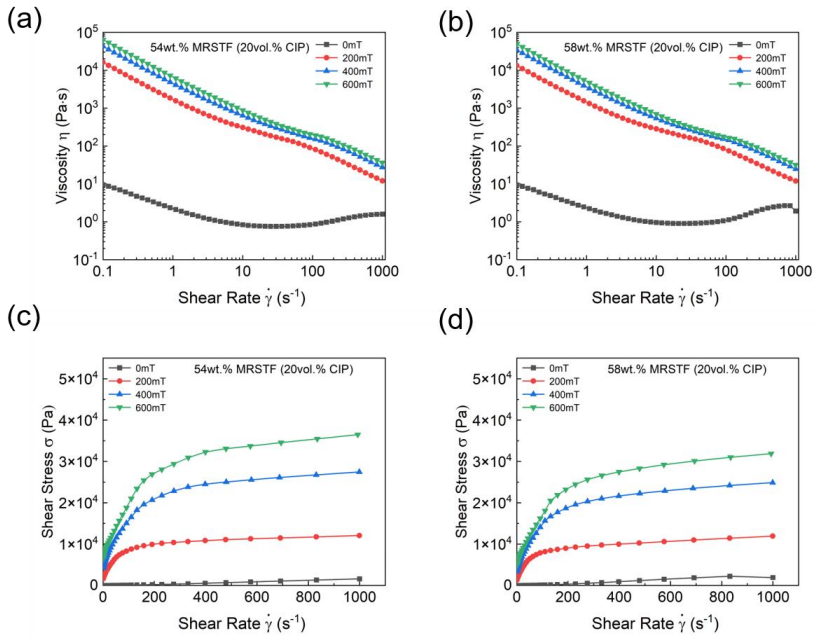

Figure S6. The curves of viscosity versus shear rate of different SiO_2 mass fractions of MRSTF (20 vol.% CIP) under different magnetic field strengths: (a) 54 wt.% and (b) 58 wt.%. The curves of shear stress versus shear rate of different SiO_2 mass fractions of MRSTF (20 vol.% CIP) under different magnetic field strengths: (c) 54 wt.% and (d) 58 wt.%. MRSTF: magnetorheological shear thickening fluid; CIP: carbonyl iron powder.

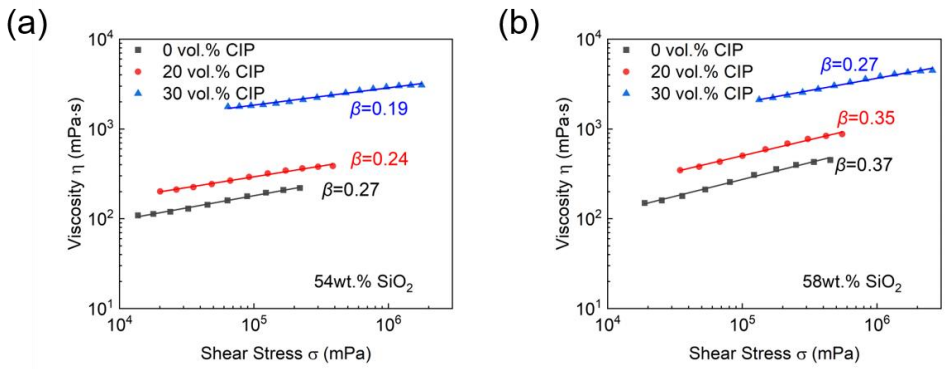

Figure S7. The fitted curves of $\log(\eta)$ versus $\log(\sigma)$ for (a) 54 wt.% SiO_2, (b) 58 wt.% SiO_2. CIP: carbonyl iron powder. CIP: carbonyl iron powder.

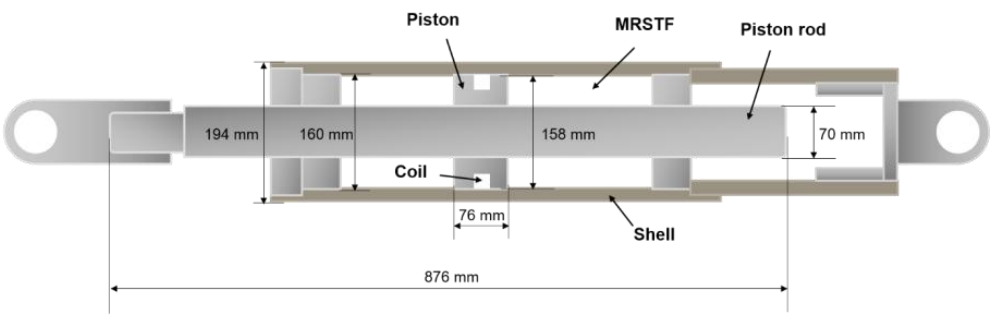

Figure S8. The diagram of MRSTF damper. MRSTF: magnetorheological shear thickening fluid.