STM-SCREEN™ Compared to Brute Force

Responsiveness to Material Loading & Performance

General Kinematics is known as the leader in Two-Mass vibratory technology. This technology has made it possible to handle larger capacities while prolonging the life of the equipment. Here is how it works, as material loaded on a Two-Mass STM-SCREEN™ is increased, the natural frequency of the STM-SCREEN™ changes, and the stroke (screen energy exerted on the material) increases, thus making it responsive to material flow.

Conversely, brute force screens respond negatively to material loading. As material load increases, the stroke decreases. A brute force machine will typically have large motors and eccentric weights that take time to startup and can sometimes get stuck in this frequency during startup causing structural stresses. After startup, it operates far away from the isolation frequency and thus does not benefit from the Two-Mass curve (noted above). The power required to achieve a design stroke is a direct correlation of the mass it must vibrate. Therefore, with an increase in material load, the design stroke will decrease. With this inherent difference, Two-Mass technology maintains screen efficiency and screening capacity at all times, while brute force screening efficiency and capacity will decrease under full load and surge conditions. Performance uptime is impacted by the mechanical design of the two different styles

Summary Comparison of STM-SCREEN™ vs. Brute Force Screens:

STM-SCREEN™	Brute Force
The Two-Mass Sub Resonant Technology responds positively to material loading. Machine design takes into consideration the STM-SCREEN™ weight and material surge weight and optimizes the motor HP and spring network so that screening efficiency and capacity are not affected as process conditions vary.	The Brute Force design responds negatively to increased material loading, perhaps significantly under surge conditions. This will decrease stroke and diminish screening efficiency. The machine design must take into account the motor/drive mass, screen body mass, and material mass. All 3 consume the motor/drive HP, which is limited.

Isolation of Vibratory Forces:

STM-SCREEN™	Brute Force
Use of an exciter/drive isolation spring assembly.	Use of a large spring supported isolation frame.

Structural Design – Integrity:

STM-SCREEN™	Brute Force
Drive force is evenly distributed through the spring network to support the structure of the screen body.	Drive force is concentrated in one area of each side panel. Side panel construction cannot survive the concentrated forces and often fail.
For the larger STM-SCREEN™ the body has a central panel to more evenly distribute drive forces. This also restricts any torsional forces.	For larger Brute Force screens the drive forces to the side panel intensify as the beam width, mass, and forces are increased as resistance to torsional forces decreases.

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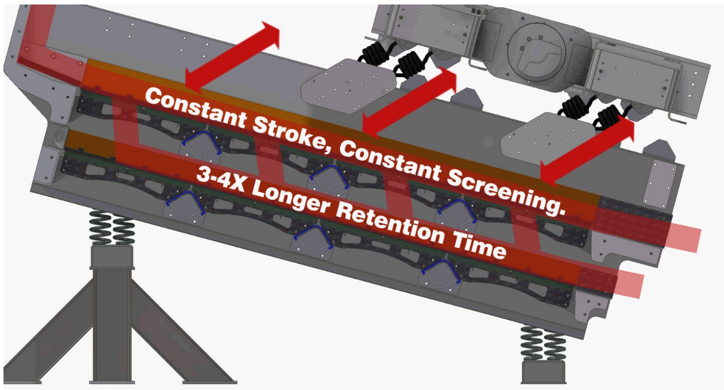
Increased Efficiency and Longevity

Designed to keep material on the screen, field tests show we achieve a 3 – 4 times longer material retention than banana screens.



Capacity & Screen Retention Time:

STM-SCREEN™	Brute Force
The STM-SCREEN™ design considers all masses plus optimum retention time for effective screening and de-watering. The motor HP and spring network is sized accordingly. Retention time on high capacity screens typically exceeds 25 seconds.	The Brute Force motor/drive HP is limited. So it is important to minimize the variability of material mass. The standard approach is to accelerate the material flow to minimize material retention and subsequent mass, on the screen, <6 - 10 seconds is typical for high capacity screens.
Increased material retention time increases material mass which is considered in the STM-SCREEN™ design.	Increased material retention time increases the demand for motor/drive HP which is already limited by the motor/drive mass and screen body mass.
Longer material retention time allows for spray manifolds to assist screening at the feed end. This maximizes screening efficiency and provides sufficient time for de-watering of the over-size material at the discharge end.	With limited material retention time, spray manifolds are typically limited. The spray manifolds are located near the discharge end of the screen which limits screening efficiency and de-watering.

HP Requirements:

STM-SCREEN™	Brute Force
While the total weight of the STM-SCREEN™ is significantly higher than a similar capacity Brute Force Screen. They typically require 1/3 the drive HP of a Brute Force Screen.	As screen size and capacity goes up, increasingly larger motors and larger eccentric masses are required to drive the machine.
Smaller vibratory motors rapidly reach operating speed which reduces any induced stress as the machine goes through any isolation frequency.	Large motors with large rotating eccentric wheels are slow to reach operating speed which increases stress on the machine due to the prolonged exposure to isolation frequencies.

Maintenance:

STM-SCREEN™	Brute Force
Require routine inspection and lubrication of the sealed vibratory motors. Along with the periodic replacement of the screen media panels.	Requires an oil bath to cool the eccentric drives.
Maintenance is typically centered on component replacement; springs, slats and/or vibratory motor.	Repairs include isolation springs replacement due to over stroke at every startup and shut down cycle. Recurring cracks on side panels, discharge end cross brace, and isolation mounts are also common.

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