Manufactured Sand

The Gyradisc is a machine specifically designed and built to produce large quantities of manufactured sand to high standards.

Whilst the mechanical principles are based on the Symons cone crusher to ensure high reliability, the crushing principle is unique and differs completely from other cone/gyratory crushers.

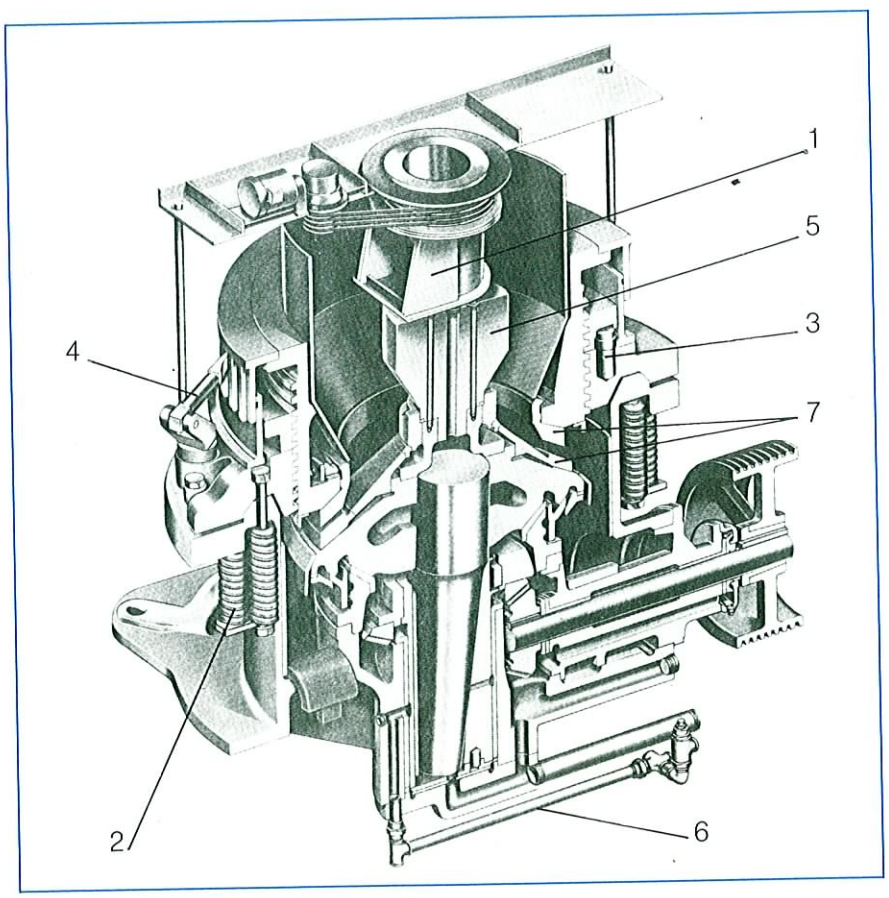
A FUNDAMENTAL CHARACTERISTIC

The major innovation of the Gyradisc is to be found in the shape and arrangement of the crushing liners which crush the material by a combination of impact and attribution :

The Gyradisc has other special characteristic features :

- rotating feed distributor (1);
- spring loaded tramp release (2);
- hydraulic operation (clamping (3), adjustment (4), clearing);
- balanced design (5);
- pressure lubrication system (6);
- precision made crushing liners (7).

The machine can be completely dismantled from above, for ease of repair and maintenance.



Interparticle Comminution

The Gyradisc produces fines by a combination of impact and attrition – a homogenous mix of coarse and fine particles is distributed radially by the rotating feed distributor and fed, layer upon layer, into the crushing cavity.

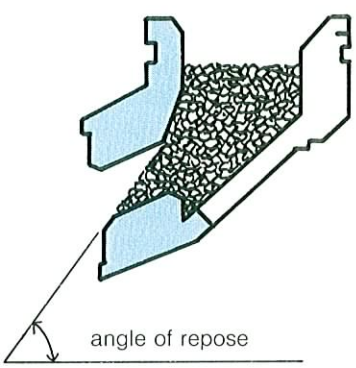
As the head angle is lower than the angle of repose of the material, flow by gravity is resisted, the head motion advancing the material outwardly – thus creating a high percentage of fine product due to the number of gyrations and cavity design. Crushing « stone on stone » ensures highly efficient crushing.

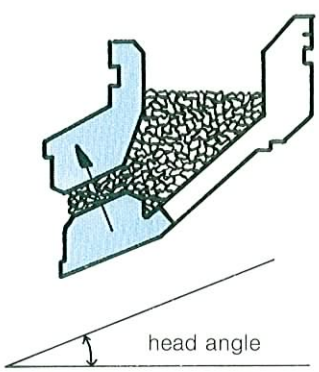
– High surface friction creates high attrition within the material to provide high fines content.

– The crusher setting itself is not the only control of product size, reduction takes place within a deep bed of material.

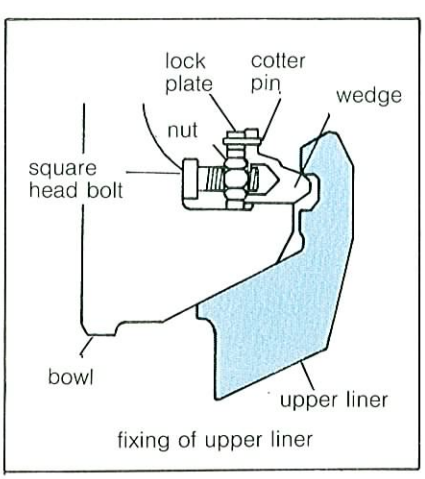
The unique process overcomes the traditional difficulties of producing high quality fines by recycling undersize to the crusher (up to 80%).

The Gyradisc is unique in adopting this method.



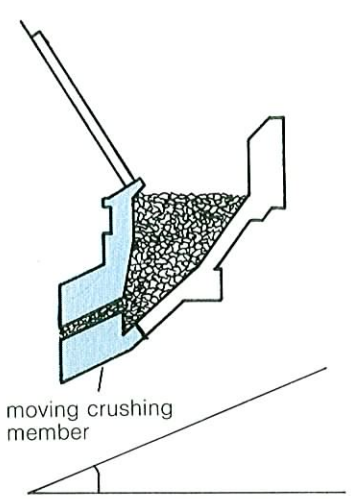


Gyradisc liners are shorter and less inclined than conventional cone crusher liners. Their method of fixing enables quick and easy replacement and eliminates the need for backing material.



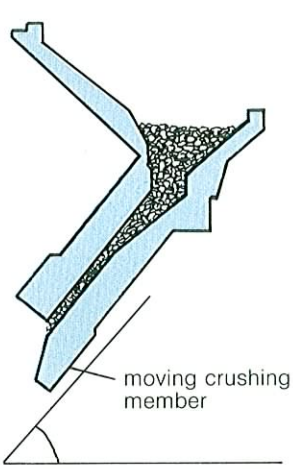
fixing of upper liner

GYRADISC



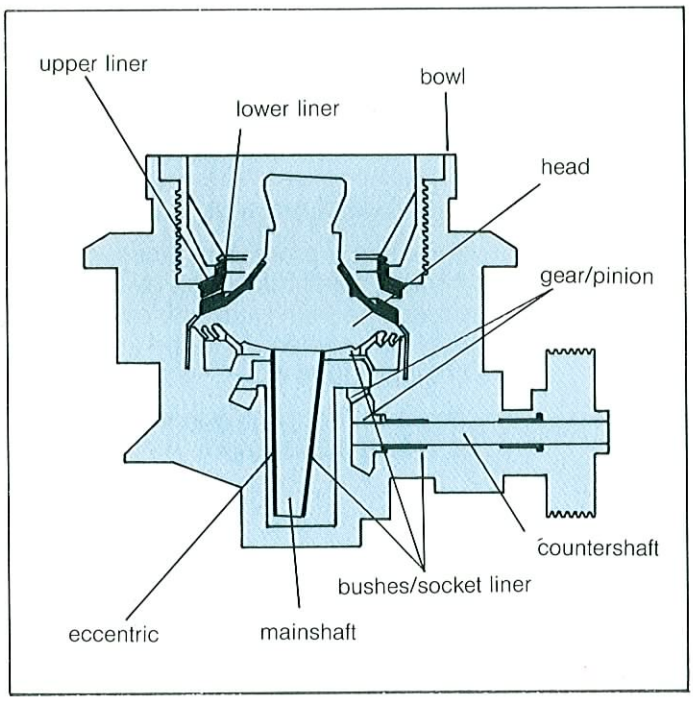
head angle 25°

CONE CRUSHER



head angle 41°

36" + 48" Gyradisc Crushers



The major components of the Gyradisc are illustrated (left) in this cross sectional view.

Mechanical reliability is ensured by :

– A small number of moving parts.

– Efficient sealing against dust.

– Generous proportions of the bronze socket liner to support head. Bronze sleeve-bushes for prolonged service.

– Long liner life because of the crushing action. Wear is kept even by the method of adjustment. The bowl being rotated about the head for maintaining setting.

Technical data

		36" GYRADISC	48"GYRADISC
Crusher			
Total weight	kg	11.050	26.650
Weight of heaviest piece	kg	2.800	6.700
Crusher pulley :			
– pitch diameter	mm	762	915
– force width	mm	227	359
Oil tank capacity	l	420	830
Cooling water requirements (air blast cooling available to order)	m^3/h	3 to 5	12 to 15
Motor			
Speed	RPM	1.450	1.450
Power required	kW	75	160
Motor pulley			
– pitch diameter	mm	335	375
– face width	mm	226	298
Drive belts			
– number required		6	8
– section	mm	32 x 19	32 x 19
– overall length	m	(1) 4,463 (2) 3,729	(1) 6,103 (2) 4,063

(1) Horizontal drive (concrete base) – (2) Vertical drive (steel structure)

Performance

Maximum feed size	30 mm	40 mm
Capacity (0/12 mm - no rejects)	40/50 t/h	80/90 t/h

Ease of Operation

HYDRAULICS

Standard or optional, dependant upon model choice, the hydraulic system enables finger tip control of the machine :

– Hydraulic clearing enables rapid restart after a blockage during operation (power failure etc.). Jacks raise the bowl assembly, thereby opening the crusher cavity and enabling the crusher to empty.

– Clamping/adjustment. Adjustment is by means of two rams mounted on opposite sides of the crusher, any change in setting obtained by rotating the bowl. Clamping is by failsafe "pressure off" method–disc springs within the clamp cylinders clamping the bowl. – hydraulic pressure releasing the cylinders for adjustment.

SAFETY FEATURES

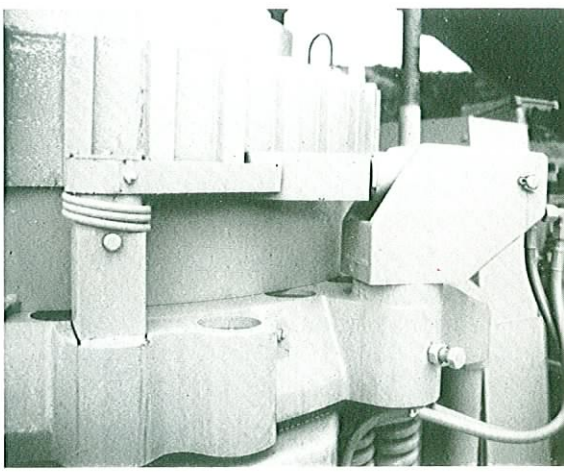
Safety monitors are incorporated to measure :

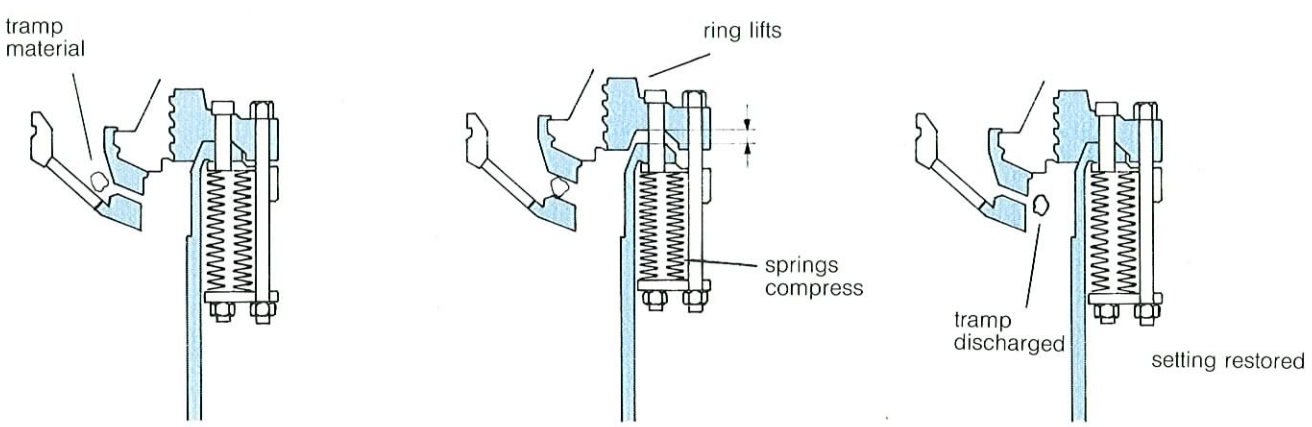
– Oil circulation.
– Oil pressure.
– Oil temperature.

These, when activated, can :

a) Sound or give visual alarm
b) Stop the feed
c) Stop the crusher

Clusters of coil springs, mounted around the adjustment ring assembly, provide a mechanical safety device against overload and the passing of tramp iron. The system (see below) ensures an immediate reaction (opening the crushing chamber) and a quick return to the original setting.





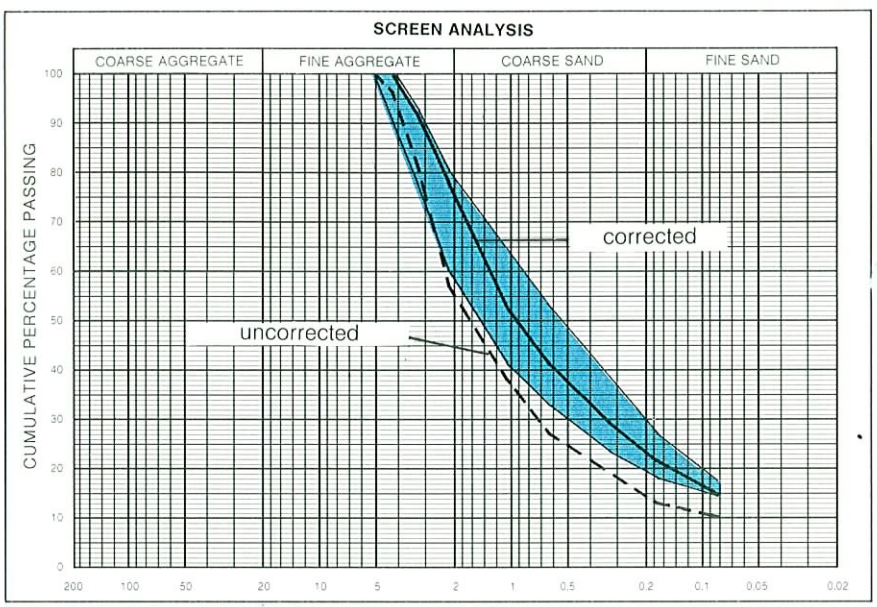
Application Examples

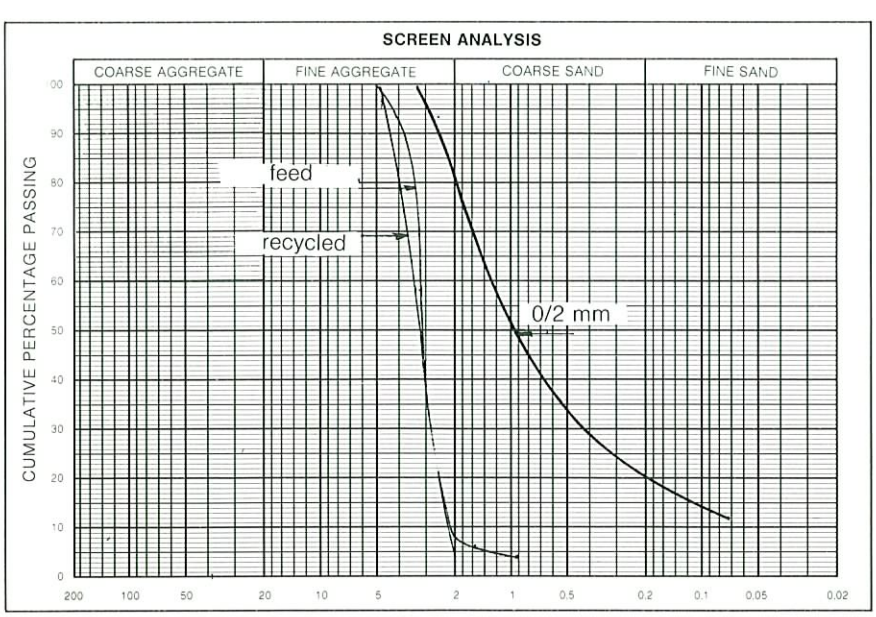
1) Production of 0/4 mm sand from 10/35 mm gravel.

In this application a Gyradisc mobile plant was installed together with a screening plant incorporating blending capabilities.

The 0/4 mm thus produced was suitable for concrete, as well as asphalt, construction.

0/4 mm asphalt sand





2) Production of 0/2 mm sand from 2/4 mm crushed aggregate.

As the feed is all smaller than the crusher setting, all the crushing is by interparticle action.

In this application, the average throughput is 20 T/H of fine sand.

To our knowledge, the Gyradisc is the only cone crusher in the world capable of this performance.

Application Examples

3) Production of 0/10 mm from 35 mm round gravel.

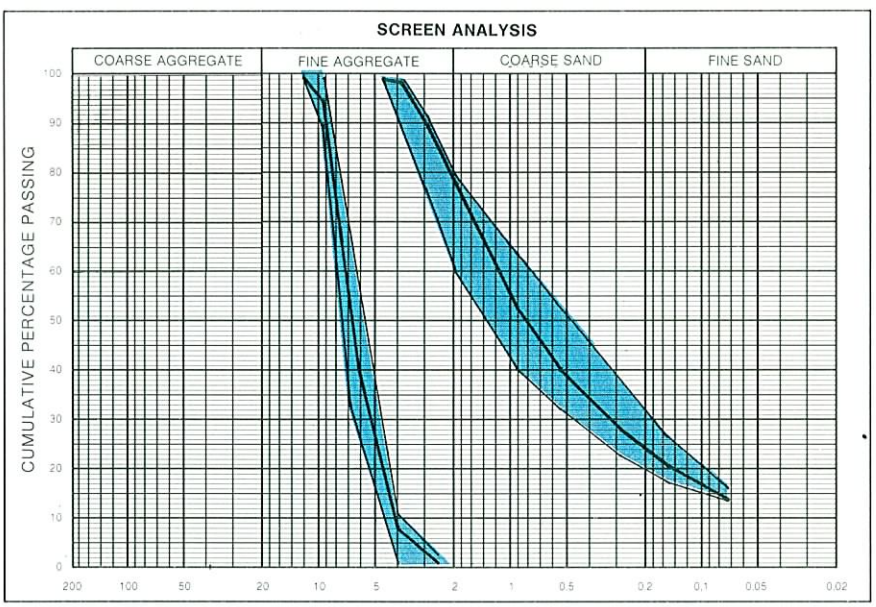
Here, the Gyradisc produces 0/4 mm and 4/10 mm from minus 35 mm gravel rejects.

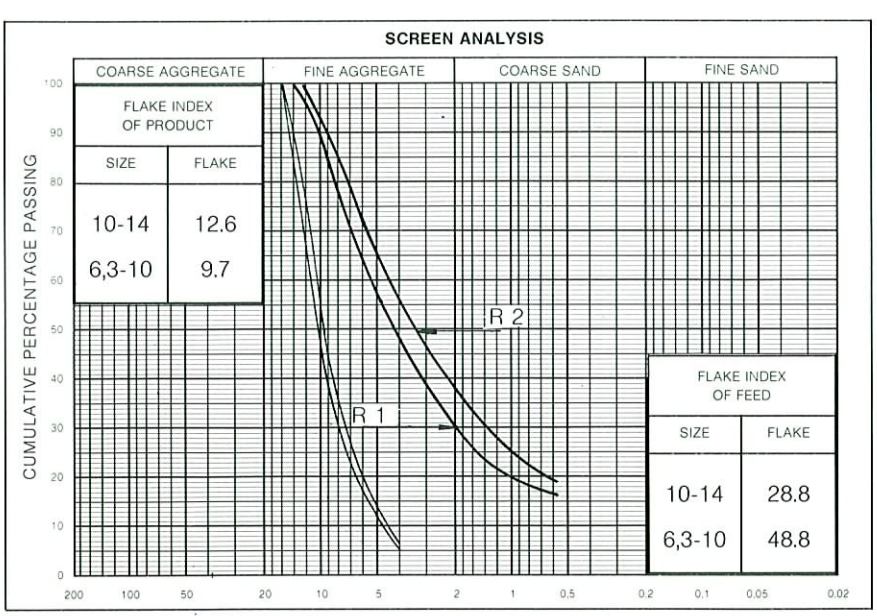
– The 0/4 mm has a filler content of 13.5%.

– The flake index is less than 20.

– 68% of the product has all crushed (ie no rounded) faces.

Sand and fine aggregate for asphalt





4) Using a Gyradisc to improve shape.

The Gyradisc is used, in this example, to recrush 4 mm/14mm quartzite with a high flake index.

After being crushed in the Gyradisc the flake content has been considerably reduced.

Generally, using a Gyradisc in a controlled circuit will improve shape by at least 50% (dependant upon type of material, moisture content and cleanliness of the feed).

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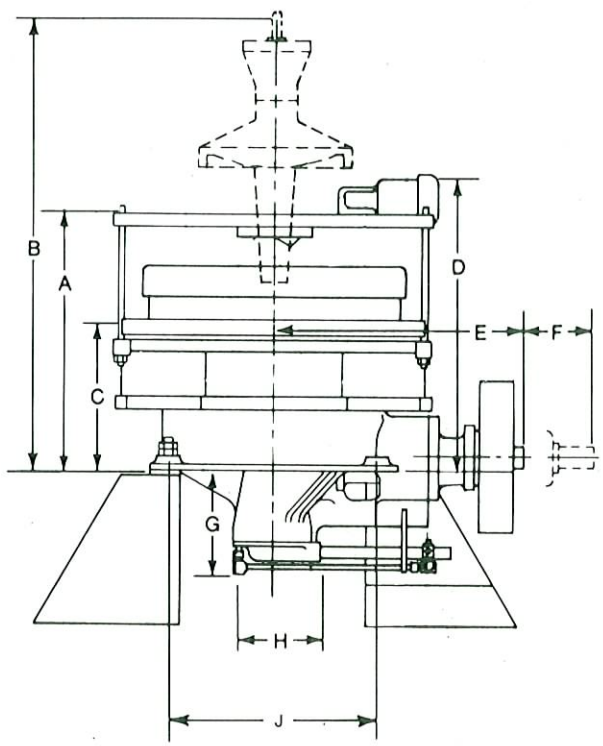

GYRADISC CRUSHER DESIGNATION		HEAD DIAMETER	A	B	C
ENGLISH	METRIC				
36" GD	900 GD	36" (914mm)	6'-11 1/2" (2121mm)	11'-1/2" (3366mm)	3'-5 3/8" (1051mm)
48" GD	1200 GD	48" (1219mm)	8'-3 7/8" (2537mm)	13'-3" (4039mm)	4'-3 1/2" (1308mm)

GYRADISC CRUSHER DESIGNATION		HEAD DIAMETER	D	E	F	G	H	J
ENGLISH	METRIC							
36" GD	900 GD	36" (914mm)	7'-4 1/8" (2238mm)	4'-8" (1422mm)	2'-3" (686mm)	1'-9 1/2" (546mm)	1'-9 1/4" (540mm)	4'-4" (1321mm)
48" GD	1200 GD	48" (1219mm)	8'-8 1/2" (2654mm)	5'-5 1/2" (1664mm)	2'-10 1/2" (876mm)	2'-7 7/16" (799mm)	2'-3" (686mm)	5'-9 1/2" (1765mm)