

TIL Tractors India



Hyster TIL ReachStacker
RS 45-27 CH, RS 45-31 CH

CHARACTERISTICS	1.1	Manufacturer	
	1.2	Model designation	
	1.3	Power: battery, diesel, LPG, electric mains	
	1.5	Load capacity first / second / third container row	Q (kg)
		Load capacity first / second / third row, with Stabilizer applied (truck static)	Q (kg)
	1.6	Load centre first / second / third container row, from face of front tyres	c ₁ /c ₂ /c ₃ (mm)
1.8	Load distance to face of front tyres / front of Stabilizer	x (mm)	
1.9	Wheelbase	y (mm)	

WEIGHTS	2.1	Unladen weight	kg
	2.2	Axle loading at load centre c1, with rated load, front / rear	kg
	2.2	Axle loading at load centre c2, with rated load, front / rear	kg
	2.3	Axle loading at load centre c1, unloaded, front / rear	kg
2.3	Axle loading at load centre c2, unloaded, front / rear	kg	

WHEELS & TYRES	3.1	Tyres: L=pneumatic, V=solid, SE=pneumatic-shaped solid	
	3.2	Tyre size, front	
	3.3	Tyre size, rear	
	3.5	Number of wheels, front / rear (X = driven)	
	3.6	Track width, front	(mm)
	3.7	Track width, rear	(mm)

DIMENSIONS	4.1	Boom angle minimum / maximum	degrees
	4.2	Boom height, minimum	h ₁ (mm)
	4.3	Minimum distance spreader from ground	h ₂ (mm)
	4.4	Maximum lift height under spreader, first / second container row	h ₃ (mm)
	4.5	Boom height, maximum	h ₅ (mm)
	4.8	Seat height	h ₇ (mm)
	4.19	Overall length	l ₁ (mm)
	4.20	Length without boom	l ₂ (mm)
	4.21	Overall width over front tyres	b ₂ (mm)
	4.30	Sideshift movement, from centre to left / right	b ₃ (mm)
	4.31	Ground clearance lowest point, without load	m ₁ (mm)
	4.32	Ground clearance, centre of wheelbase	m ₂ (mm)
	4.34	90° Stacking Aisle 20° / 40°, spreader central above front axle, without operating clearance	Ast (mm)
		90° Stacking Aisle 20° / 40°, without operating clearance	Ast (mm)
90° Stacking Aisle 20° / 40°, with 200 mm operating clearance		Ast (mm)	
90° Stacking Aisle 20° / 40°, with 10% operating clearance		Ast (mm)	
acc. FEM TN01		Ast (mm)	
4.35	Outer turning radius	W ₀ (mm)	

PERFORMANCE	5.1	Travel speed with load / without load - with 224 kW engine	km/h
		Travel speed with load / without load - with optional 272 kW engine	km/h
	5.2	Lifting speed with load (35 ton) / without load, first row average - with 224 kW engine	m/sec
		Lifting speed with load (35 ton) / without load, first row average - with optional 272 kW	m/sec
	5.3	Lowering speed with / without load	m/sec
	5.6	Maximum drawbar pull with load	kN
	5.7	Gradeability with load, with 224 kW / optional 272 kW engine (1.6 km/h)	%
	5.8	Maximum gradeability with load (with 224 kW engine)	%
	5.10	Service brake	

ENGINE	7.1	Engine make and type	
	7.2	Engine power, in accordance with ISO1585 maximum @ 1800 rpm / nominal @ maximum 2100 rpm	kW (hp)
	7.3	Governed maximum engine speed	rpm
	7.4	Number of cylinders / displacement	cm ³

OTHER	8.1	Drive control	
	8.2	Pressure for attachments	bar
	8.3	Oil flow for attachments	l/min
	8.4	Noise level LpAZ, inside cab, per EN12053†	dB (A)
	8.4.1	Noise level LWAZ, outside truck, per 200	dB (A)

HYSTER TL			HYSTER TL		
RS 45-27 CH			RS 45-31 CH		
Diesel			Diesel		
45 000	27 000	13 000	45 000	31 000	16 000
N/A			N/A		
1 865	3 815	6 315	1 865	3 815	6 315
840 / N/A			840 / N/A		
6 200			6 200		

68 500		72 200	
99 900	13 600	99 600	17 600
87 800	7 700	94 500	8 700
35 300	33 200	35 000	37 200
40 500	28 000	40 300	31 900

L		L	
18.00 x 25		18.00 x 25	
18.00 x 25		18.00 x 25	
4x	2	4x	2
3 094		3 094	
3 060		3 060	

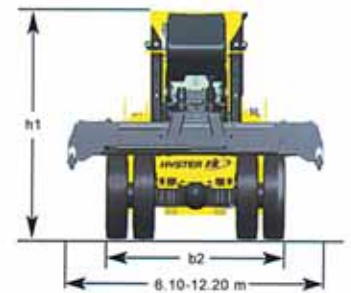
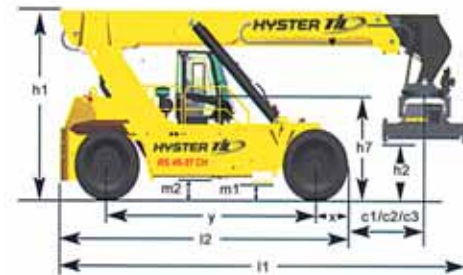
0 / 59		0 / 59	
4 700		4 700	
1 342		1 342	
15 260	13 850	15 260	13 850
18 110		18 110	
2 555		2 555	
11 873		11 873	
8 360		8 360	
4 220		4 220	
800	800	800	800
312		312	
495		495	
9 706	12 548	9 706	12 548
12 283	14 096	12 283	14 096
12 483	14 296	12 483	14 296
13 511	15 506	13 511	15 506
8 495		8 495	

19.9	23.1	19.9	23.1
21.3	23.4	21.3	23.4
0.25	0.48	0.25	0.48
0.28	0.48	0.28	0.50
0.46	0.45	0.46	0.45
378		378	
22	26	22	26
34		33	
Oil immersed brakes		Oil immersed brakes	

Cummins QSM11		Cummins QSM11	
224 (300)	216 (290)	224 (300)	216 (290)
optional 272 (365)	242 (325)	optional 272 (365)	242 (325)
2 100		2 100	
6	10 800	6	10 800

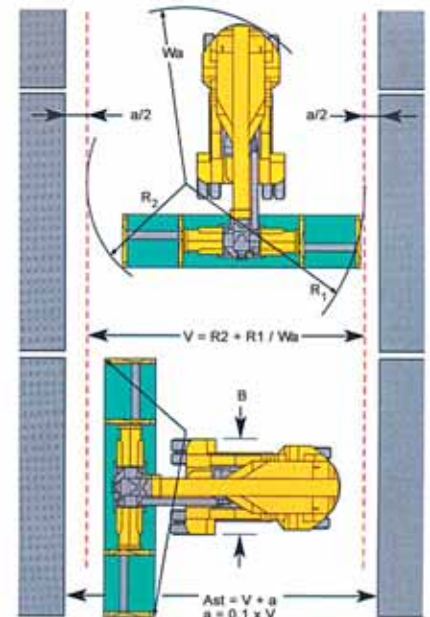
4-speed autoshift SOH TE27		4-speed autoshift SOH TE27	
optional SOH TE32		optional SOH TE32	
260		260	
70 or 110		70 or 110	
76		76	
109.6		109.6	

Illustration shows CH model



90 Degrees Stacking Aisle

(According to FEM TN01)



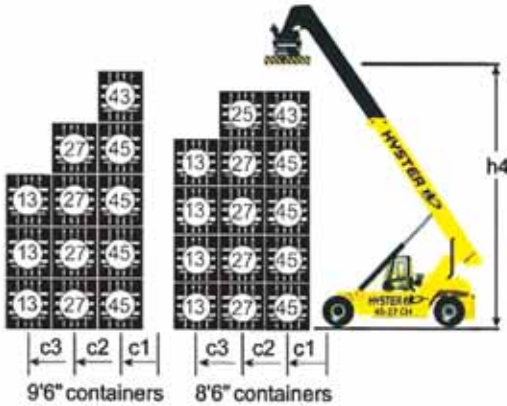
Ast = Practical 90 degrees Stacking aisle
 = V (theoretical stacking aisle) + a
 (total operating clearance)
 Where V = R2 + the larger of R1 or Wa
 a = 200 mm (100 mm each side acc. VDI)
 See line 4.34
 a = 10% of V (acc. FEM TN01 recommendation).

NOTE: Specifications are affected by the condition of the vehicle and how it is equipped, as well as the nature and condition of the operating area. If these specifications are critical, the proposed application should be discussed with your manufacturer/dealer.

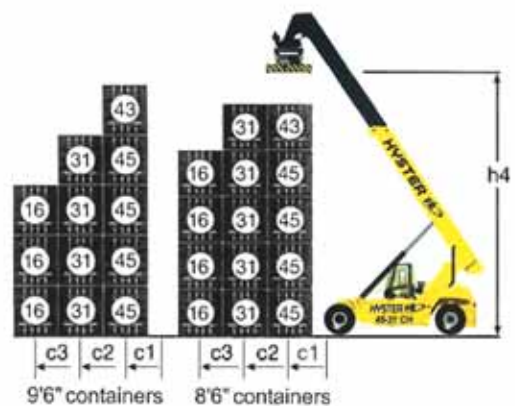
Gradeability figures (lines 5.7 & 5.8) are provided for comparison of tractive performance, but are not intended to endorse the operation of the vehicle on the stated inclines. Follow instructions in the operating manual regarding operation on inclines.

Rated Capacities and Stacking Heights-Container Handlers

RS 45-27 CH Container Spreader



RS 45-31 CH Container Spreader



First, Second and Third Row ReachStackers



The Hyster TIL RS range of **ReachStackers** has been designed to achieve maximum space utilisation on container terminals, thanks to outstanding manoeuvrability, superior handling speeds and unrestricted stacking capabilities, in an all-in-one package:

- **Fast lifting** : The practical average 4-mode speed is a fantastic 0.41 m/sec, with the standard 224 kW (300 hp) engine.
- **Capacities** of up to 31 tonnes in the 2nd row, ensuring that there are no container weight limitations when handling containers in the 2nd row.

- **Ability to stack containers five-high** (9'6" in the 1st row and 8'6" in the second row).
- **Excellent visibility** all-round, thanks to a Powered Sliding Cab (standard), widely spaced rear boom supports and a sloping rear counterweight.
- **Proven concept**, using the key structures (frame, boom and spreader) of the original Hyster ReachStacker, together with the proven driveline, hydraulic and control components.
- The standard electronic **Load Moment Protection** system features a load weight indicator display.
- **Twistlock indicator lights**, on the spreader and in the cab, are standard equipment.
- **Tropical cooling package**, for working in ambient temperatures of up to 50°C is standard.
- **Engine and transmission** protection system is standard.
- **Automatic transmission shifting** is standard, featuring soft-shift system, with **protective lock-out** on forward reverse shifting.

A Framework of Experience

The frame and boom structures used in the new RS series are based on the proven design employed in the original Hyster ReachStacker.

- The frame is immensely strong and the widely spaced rear supports give rigidity and excellent rearward visibility.
- The new boom design, with increased plate thickness on the inner boom, offers increased durability, easier maintenance, as well as less wear and improved component life. This results in lower service costs and improved uptime, which help to reduce overall operating costs.
- The pivot points for the boom are positioned right at the back of the frame and therefore minimize boom

'overhang', resulting in a very compact machine and ensuring that the excellent rearward visibility is maintained, even when the boom is raised.

- The two-stage boom is rectangular in shape, is welded both inside and outside, and telescopes on self-lubricating self-aligning non-metallic bearings.



Power & Performance

Fastest

The hydraulic system is highly efficient, and features 'Power on Demand' and Two-Speed Lift' functions.

- The result is lifting speeds that are class leading: The practical 4-mode average lifting speed is a fantastic 0.41 m/sec. with the standard 224 kW (300 hp) engine.
Average of four lifting modes :
Unladen lift speed = 0.48 m/sec.
Laden lift speed = 0.25 m/sec (with 78% load = 35 ton).
Unladen lowering speed = 0.45 m/sec.
Laden lowering speed = 0.46 m/sec.

Clean Power Choice

The Hyster **ReachStackers** are equipped with the **Cummins QSM 11 industrial** 6-cylinder in-line turbo charged diesel engine, with charge-air cooling.

The Cummins QSM 11 diesel engine features :

- 10.8 litre capacity.
- **Low exhaust emissions** which conform to the EC tier 3 standard for NRMM (Non-Road Mobile Machinery).
- **Engine protection** system, acting on low oil pressure and high coolant temperature. The system initially derates the engine power and finally shuts down the engine and features an override function for emergency situations.
- The 'Cooling on Demand' and 'Load Sensing Hydraulics' systems only use power when needed and therefore help to reduce overall fuel consumption.

- **Cooling on Demand** with remote fan mounting resulting in reduction of noise and availability of more power
- **Fuel tank** 890 litre (830 litre useable) - more than ample for a three-shift operation.

Standard Power Package

- Performance of maximum **224 kW (300 hp)** at only 1800 rpm, offering extra durability for long periods of peak power operation. Smooth torque of **1424 Nm** at 1000-1400 rpm provides excellent acceleration and lugging power, together with low fuel consumption.
- This 224 kW (300 hp) engine is combined with the S.O.H. (Spicer Off-Highway) TE27 4-speed autoshift transmission.

Drive Axle

- The wide heavy duty drive axle with reinforced spindles offers excellent sideways stability and long-term durability thanks to the strong end reduction shafts and gears.
- Long-term durability thanks to the strongest end reduction shafts and gears available.
- Oil-immersed brakes on the drive axle feature oil cooling for durability and are virtually maintenance free.





Autoshift

S.O.H. transmissions are fitted with the industry leading automatic 'soft-shift' gear change system. This autoshift system features :

- Load-sensitive shifting action.
- A 'soft-shift' characteristic (through electronic 'throttle-back' function during gear change). In addition to providing improved driver comfort, the system eliminates shifting-shocks on the driveline.
- An 'on the move' forward-reverse shifting lock-out function protects the transmission and driveline against overloading, during abrupt direction changes.
- Back-up (reverse driving) alarm.

Cooling

- The cooling air outlet is located between the boom towers, for an improved cooling air flow path. This avoids dust being drawn from underneath the truck and hot air being circulated inside the truck. The hydraulically driven cooling fan only operates on-demand, consuming less energy, improving fuel economy and reducing noise.

- A tropical cooling system is standard and offers additional cooling of the engine and hydraulic systems, for working in ambient temperatures of up to maximum 50°C.

Protection Systems

- Engine protection system, acting on low oil pressure and high coolant temperature, is standard equipment.
- Transmission protection system, acting on high oil temperature, is also standard equipment. These systems initially derate the engine power and finally shut down the engine, and feature an override function for emergency situations.

Steer Axle

- Double-acting, single steering cylinder with non-adjustable tie rods. It is renowned for its long lifespan and low maintenance requirements.
- Steer wheel nut protection (recessed studs) is also standard.





Exceptional All-round Visibility

The "Vista" cab, has been designed to be the industry-leading ergonomic operator environment, and focuses on optimizing driver comfort and visibility for maximum productivity, through:

- Large windows, fitted with tinted safety glass, offer excellent all-round visibility. This is further enhanced in poor weather conditions by a fresh air inlet, sliding windows and wipers (with intermittent wipe function) and washers on front, top and rear screens.
- Air-conditioning is integrated into the system, with manual temperature control. Sunshade screens are fitted on the top and rear windows.
- Joystick for intuitive control of boom lift and telescope, and spreader functions: Sideshift, Rotation, Telescope 20'-40'. Twistlock unlocking (locking is automatic) is operated separately by a toggle switch.
- Full-suspension fully adjustable driver's seat with a high backrest, seat belt, operator presence system, and extra air circulation fan.

- Adjustable steering column, power-assisted steering and lever controls, push-button parking brake and conveniently positioned instruments,
- Responsive, fully hydraulic brakes and an automotive style pedal layout further contribute to driver confidence and comfort.
- Rear view mirrors (wide-view type) inside cab and outside rear view mirrors on the front fenders.
- Low noise level of 76 dB(A) driver's ear BITA equivalent.
- The cab can be moved to various positions for optimum visibility in variable operating conditions and/or to accommodate drivers preferences.



Powered Sliding Cab

A powered Full-sliding cab is standard on CH models :

- When the cab is located at the rear of the machine, it offers the most comfortable viewing angle when stacking containers 4-5 high, and this is often preferred by drivers, due to its position behind the lift cylinders.
- Cab entry / exit is only possible in the rearward position.



Rear Visibility

Rearward visibility has been greatly enhanced thanks to:

- The widely spaced rear boom supports and rear-sloping design of the counterweight.
- The size of the counterweight extending out at the rear of the machine has been kept to a minimum. This has been achieved by using a solid piece of metal for the rear section of the box-type frame, so keeping much of the required ballast inside the machine.
- The unique 'boomerang' shaped frame, with the pivot point of the boom at the furthest point to the rear.



Ease of Servicing

- The hydraulic oil tank features a gauge for oil level and temperature as well as magnetic drain plugs.
- Quick removable (lightweight aluminium) floor plate sections, which provides truly excellent access for service work.
- New side panel design, plus the open structure, steps and running boards offer easier access to major systems and components.
- Easier access to electrics, oil and air filters.
- Driver access from the right-hand side is now optional.





Hydraulic & Electrical Systems

Hydraulics

- E-hydraulics, proportional controls and optional soft start/stop improve controllability and durability.
- **Pumps** : Two variable-displacement piston pumps with a total performance of maximum 585 L/min. Hyster two-speed system with regenerative function results in high lift speeds.
- When hydraulic temperature is too low for operating conditions, the engine will derate. To prevent overheating of the hydraulic oil, an option is available which will reduce truck speed, giving time for the oil to cool down to the correct operating temperature.
- Leak-free ORFS (O-ring) type fittings are used throughout the whole machine.
Filtration: Full-flow return line filter with 10 micron cartridge on the main system, plus in-line pressure filter with 20 micron on power-assist and support systems.
- Large oil cooler for the hydraulic system, suitable for working in ambient temperatures of up to 50°C.
Hydraulic oil tank: 600 litre useable volume, with oil level and temperature gauge and magnetic drain plugs.
- Hydraulic control program for easy status and diagnostics and custom settings. Hydraulic temperature protection means lower service costs and improved uptime.

- Emergency lowering device, to lower the spreader when the engine is not running.
- Centralised pressure check points.
- Damping system on the longitudinal (forwards / backwards) oscillating movement of the spreader, providing an effective 'controlled sway' of the spreader, under varying load weight and operating conditions.

Electrics

- 24 Volt system, 120 A alternator, battery master switch.
- 'CANbus' diagnostic connection in the cab for engine, transmission, instruments, and load-moment protection system.



Spreader Specifications

Container Handling Spreader

The Telescopic Container spreader, for handling 20' - 40' ISO containers, features:

- A uniquely widely spaced boom head, to provide strong support for the Spreader.
- A rotator with two hydraulic oil-immersed brakes and hydraulic motors.
- Ample rotation angle of +185 / -95 degrees.
- Free (non-powered) sideways articulation of +/- 2.5 degrees, to facilitate easy handling of containers on / off sloping trailers.
- 1600-mm total sideshift movement, 800 mm to each side.
- Pendular floating ISO twistlocks.
- Twistlocks turn automatically to locked position, unlocking is done manually.

Other Features

Brakes

Service Brake : Multiple oil immersed (wet) discs on the drive axle, with cooling system.

Parking Brake : Dry disc brake on the drive axle input shaft, spring applied and hydraulically released.

Electronic Load Moment Control System

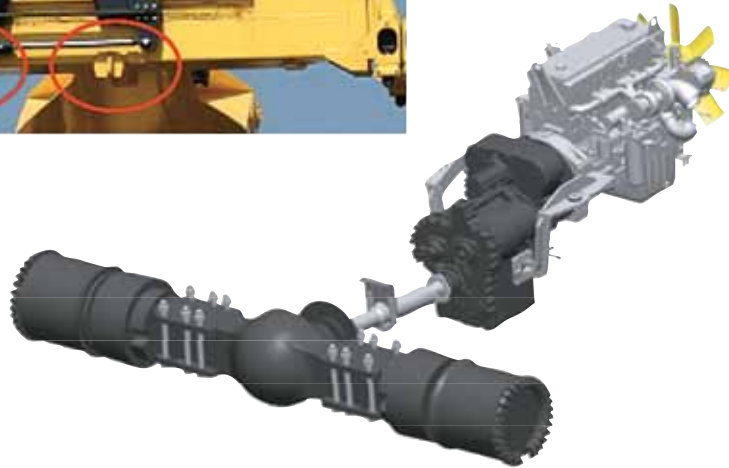
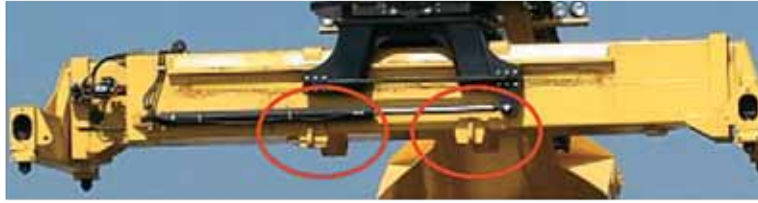
- With automatic shut-off beyond the rated load-moment.
- Automatic shut-off function on boom lowering and telescope-out.
- Warning lights in the dash board: Green, Orange (at 90% load-moment), Red (at 100% rated load-moment.)
- Digital display unit, showing actual load, max. rated load, and load distance plus load height.

Lights

10 front work lights (4 on the boom and 4 on the front fenders and 2 rear, all halogen type) 2 front marker lights, 4 direction indicators, 2 tail/stop lights, one orange flashing beacon.

2 work lights on the container spreader, directed towards the engagement points.

Optional Equipment



- **Extra power package** : As an option, for use in the heaviest duty applications, a version of the Stage IIIA Cummins QSM11 engine is available, with maximum performance of 272 kW (365 Hp) @ 1800 rpm. Maximum torque is a mighty 1674 Nm @ 1000-1400 rpm. The standard transmission is the TE-27 series with the TE-32 available as an option.
- **Special tyres**: Bias or diagonal type, with tread or as 'slicks'.
- **Automatic greasing system**: On the truck, the boom and the CH or IH spreader.
- **Special RAL colour(s)** paint.
- **Spare wheel** (complete tyre and rim).

On the Container or Intermodal Spreader

- **30' Automatic stop**, is required when handling (a) 30' container(s). Consists of: Spreader reinforcements and electrically operated mechanical stop locks at 30' spreader position.
- **Extra lifting eyes (4 x)** on the underside of the container spreader. Placed at 1335 mm (width) distance, for lifting compact general cargo (e.g. coils, blocks, machinery). Capacity 40 tonnes maximum, 10 tonnes per lifting eye. Includes reinforcements of the spreader structure.
Note: The 4 lifting eyes at the four corners of the spreader (near the twistlocks), are standard equipment. PPS (Power Pile Slope) function on the CH spreader (standard on IH). Please consult TIL for application advice of the PPS function.

In-Cab and Operator Convenience Items

- **Large multi-function colour display** (screen size 86 x 115 mm) on the Load Moment Control system, with extra functions: Engine rpm, travel speed, engine temperature.
- **Air suspended seat**, instead of mechanically suspended seat.
- **Trainer seat** (small extra seat cushion).
- **Support stand** with mounting plate, to fit computer terminal or communications equipment, in right-front area of the cab. (Restricts access via the right-hand cab door).
- **Converter**: 24 Volt DC to 12 Volt DC, to use 12 V accessories.
- **H.I.D.** ('High Intensity Discharge' Xenon lights) **work lights**, (4 x on the boom and 1 x on the rear of the truck), instead of standard Halogen lights.
Note : Only suitable for (non-public) on-terminal use, as these very bright lights may cause inconvenience for other operators / personnel.
- **Lights** on the staircase and in the engine compartment.

Overview : A Pioneer with Pedigree

TIL Limited is the country's leading manufacturer of Material Handling Equipment, which includes Cranes, ReachStackers, Port Handling Equipment and others.

TIL has for over six decades enabled customers to derive highest equipment productivity and has emerged as the Number One provider of material handling solutions in India.

Cutting Edge Technology

TIL's manufacturing facility incorporates well laid out manufacturing facilities including fully equipped machine shop, fabrications and assembly shop, finishing bays and test bed.

The research & development centre is equipped with the latest CAD / CAM facilities & latest engineering software. The state-of-the-art structural fabrication shop is equipped with automatic machines and the processes conform to ASME Sec IX ISO 3834/ EN 729, AWS D 14.3 & others.

24X7

TIL provides superior customer service through its countrywide customer support network. Backed by TILEDGE, TIL's unique value added Parts and Service Support Programme that guarantees highest return on investment.

100% Quality guaranteed

At TIL, quality is engineered to a predetermined process parameter. TIL is committed to setting higher & higher benchmarks in product quality. This commitment is reflected in the ISO 9001 Certification from Bureau Veritas Quality International.

TILEDGE, represents our unique value added customer programme which provides total support :

- Pre purchase consultancy
- Equipment investment analysis
- Ready parts availability
- On site service by engineers on call
- Complete machine rebuild
- Structured customer training on operation & maintenance

TILEDGE- programmed for optimum equipment performance and productivity.



Strong Partners, Tough Trucks, for Demanding Operations, Everywhere.



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