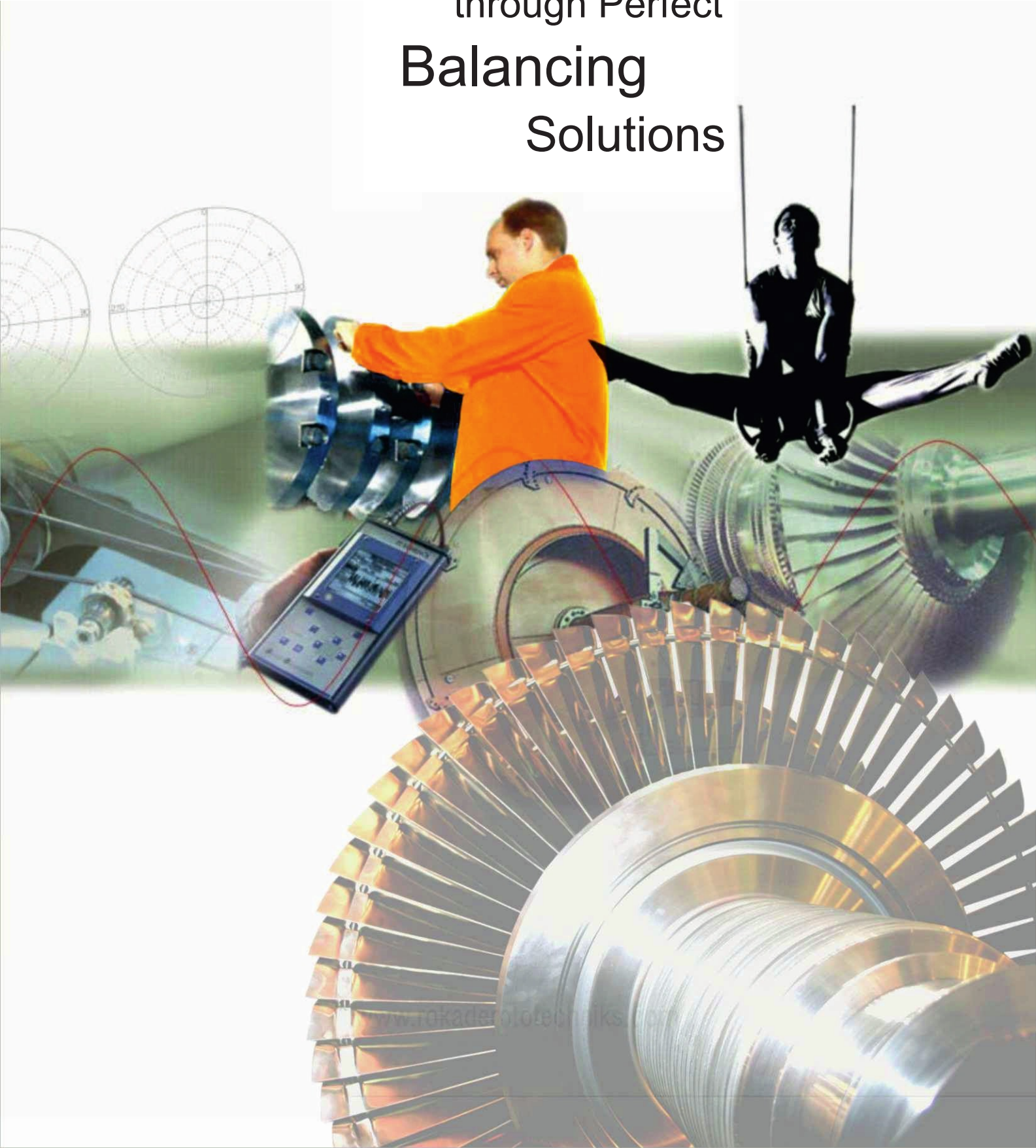


ROKADE Group of Companies

Balancing using **advanced technology**

Quality assured through Perfect Balancing Solutions



About Us

All Facilities Under One Roof :-

- In - House Dynamic Balancing
- Condition Monitoring
- Vibration Analysis
- Laser Alignment
- On-Site Dynamic Balancing
- All types of Rotor Repairs

To Offer Services to our Customers of :

- Reliability
- Optimum use
- Knowledge based
- Accomplishment
- Dependability
- Efficiency



Rokade Group of Companies, an ISO 9001:2008

Certified Company, is one of the un-disputed leaders in the field of Vibration Consultancy and Dynamic Balancing Services, for over two decades.

For 20 years we had been rendering same Services in the name of Perfect Balancing Center. The journey of these Services has been quite exciting. In order to meet increasing market needs in an efficient and professional manner, we have formed separate Company and we have now reached up to this stage with a large workshop and advanced machines & facilities. And now we have switched over these services to ROKADE RotoTechniks.

Our Mission

Leadership in Dynamic Balancing Services & Marketing of world-class highest quality Dynamic Balancing Machines & Vibration Equipment with advanced Technology & Testing Solutions.

Over the years, RRT has made an indelible mark in this field, by rendering its efficient Services to wide spectrum of discerning Clients in almost every sector of Industries, both in India and abroad.

The galaxy of our Clients is a testimony of their satisfaction and confidence reposed in RRT by availing of our Services from time to time.

We are fully equipped with state of the art technology that are available in this domain. Besides, our Engineers hold expertise in working at different sites and are capable to tackle the various critical Jobs. Experience in various Industries and operating different Machines is one important factor that sets us apart from other Service Providers of this domain.

Our qualified, trained and experienced personnel ensure that all Jobs are attended in a highly professional manner to the fullest satisfaction of our Clients.

Our dedicated employees contribute greatly to the Company's success. Their teamwork & competent expertise effectively enhance our Customers confidence & support

Rokade RotoTechniks is also Business Associates of **SCHENCK** Rotec, and **BASELINE** Technologies for marketing there products in Maharashtra & Western Region.

Our Vision

We wish to make our Organization No. 1. Customers satisfaction Company and most preferred vendor of choice to our new and existing customers at all times. In addition to the above, we would also like to become most preferred Company for our current and future employees and suppliers.

Quality Policy

We the Management and entire Staff of Rokade Group of Companies, always strive to offer Best Quality Products and prompt Services to our all Customers, at competitive prices, By seeking continual improvements in all our Processes and making use of all our resources In optimum manner. We ensure that Quality Is maintained at every level. Our personnel are Fully Aware Of Quality Aspects & Always Strive to attend Highest Quality throughout.

Our Team of Experts

We consider our team as the core strength of our Company. Hence, we take every possible measure to ensure that we employ only the best talents, who are expert in the fields of dynamic balancing, consultancy and others. We have appointed separate teams for undertaking Vibration Consultancy, On Site Balancing & Laser Alignment Jobs. All our personnel ensure that they give equal importance to the company goals, customer's requirements and the undertaken jobs. This guarantees that we attain highest level of customer satisfaction.



Our Activities



- In-House Dynamic Balancing Services-Capacity from 0.5kg to 30 tons, as well as Vertical Dynamic Balancing Services-Capacity from 0.5 kg to 500 kg.
- Vibration Consultancy Services for Condition Monitoring & Vibration Analysis.
- Laser Alignment Services.
- On-Site Balancing Services.
- Rotary Equipment repairing Services.
- Marketing of Vibration & Sound Measuring Instruments & Dynamic Balancing Machines.

Our qualified, trained and experienced personnel ensure that all Jobs are attended in a highly professional manner to the fullest satisfaction of our Clients.

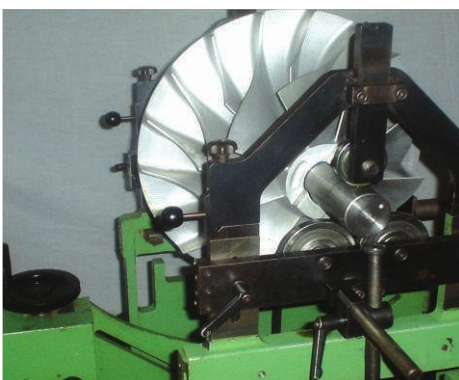
We have installed reputed world wide Brand **SCHENCK** Balancing Machines, Vibration Analyzers as well as, VMI Sweden, Prooftekniks Germany instruments for rendering the above Services.

Our dedicated employees contribute greatly to the Company's success. Their teamwork & expertise effectively enhance our Customers' confidence & support.

We are Business Associates of **SCHENCK** RoTec India Ltd., for marketing of Dynamic Balancing Machines and Vibration Monitoring Systems, and **BASELINE TECHNOLOGIES**, New Delhi based, ISO Certified Manufacturers of Vibration Instruments and Noise Monitoring Instruments.

Our Services

In House Dynamic Balancing



We have various Balancing machines installed at our Works for any type of Rotors weighing upto 30 Tons as follows:-

Horizontal Balancing Services

Installed m/cs suitable for smaller jobs

Capacity- 0.5 Kg to 300 Kg, Belt Driven SCHENCK .

We have the correct Balancing Machines, irrespective of the size of Rotors.

When your Balancing need is only one number or batch of Rotors, RRT is the right place to get the Balancing done.

Rotors operating at high speed demand highest Balancing accuracy and when the permitted residual unbalance is in micrograms, a perfect Balancing Machine proves its worth. Such precision Balancing needs Perfect Balancing Machine and persons connected with it.

When RRT meets with these requisites, you need not have any concern about your precision Balancing needs.

These small capacity Balancing Machines are suitable for your Small Armatures, Rotors Turbochargers, Spindles, Motor Cooling Fans, Gear shafts, Armature, Pulleys, Brake Drums, Small rigid & flexible Rotors etc., weighing up to 300 Kgs. For getting better result of balancing, we select small capacity balancing machines for this types of jobs.

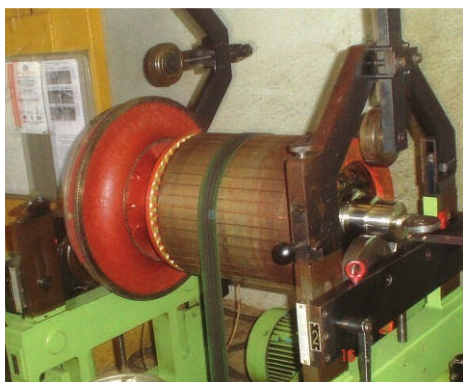
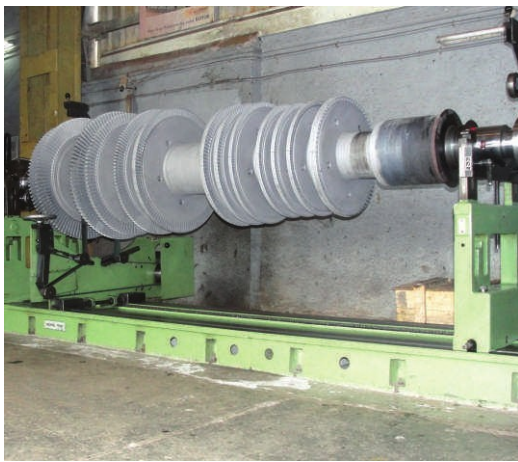
Case Study:-

The photo shows job of MAN TURBO Turbo Charger Rotor, through their vendors, being balanced at the speed of 2800 RPM.

Machine Capacity

- WEIGHT: 0.5 kg to 300kg
- LENGTH UPTO: 1500mm
- DIAMETER:1000 mm

In House Dynamic Balancing



Horizontal Balancing Services

Installed Machines suitable for Jobs
Capacity- 10 Kg to 5500 Kg, Belt Drive **SCHENCK**.

Belt drives are used for balancing of Rotors where high accuracy is desired and errors due to the drive unit cannot be tolerated and which eliminates the need of adaptors. However, it is ideally suited for cylindrical rotors where it is easy to run the belt as in case of armatures/printing rolls etc. This type of drive also reduces loading/unloading time etc.

These Machines are suitable for Balancing of Rotors, Motor rotors, Centrifuges, Separators, Decanter Bowl Conveyor assembly, etc. These machines are suitable for rotating machines at lower / medium and higher speed jobs.

This Machine is suitable for job length up to 6.5 Mtrs, Jobs like Agitator shafts, Tubular Coupling Shafts for Cooling Tower, Effluent Plant Drive Shafts, Erector Drive Shaft, etc,

Our expertise and experience are second to none - and we will be happy to share it with you. Be it Standard Rotors, Prototypes and even "problematic rotors" - we will take care of all of them.

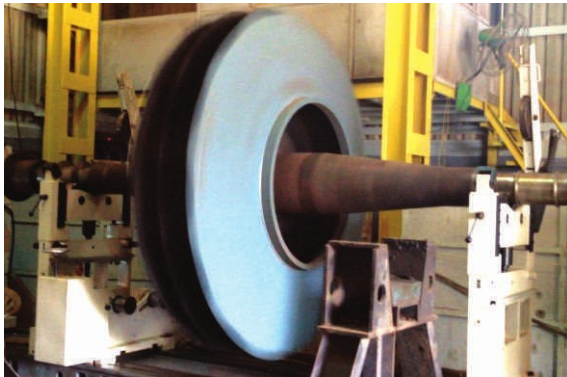
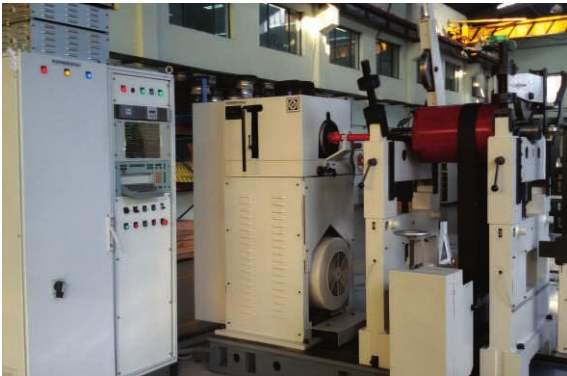
Case Study:-

The below image shows typical job of weight having 2.5 Tons being attended by us for Siemens for their Railway traction application

Machine Capacity

- WEIGHT: 10 kg to 5500 kg
- LENGTH UPTO: 6500mm
- DIAMETER:1800mm

In House Dynamic Balancing



Horizontal Balancing Services

We have recently installed new **SCHENCK** Balancing Machine Model H70U / BU+CAB690 Capacity– 30 Kg to 30,000 Kg End Drive and Belt Drive,**SCHENCK** .

These types of Machines are ideally suited for Jobs with high inertia and where high power is consumed due to air resistance etc. The weight of Rotors which can be balanced is limited by acceleration capacity of drive unit and speeds available on the Balancing Machine.

These Machines are suitable for Balancing of all bigger Rotors of Heavy Machine Re-builders / Re-winders, and are also suitable for Balancing of the above Rotors at various RPM, as per job weight specification, and balancing of all bigger Rotors, ID/FD Fans Fibrisors of Sugar Plants, large Blower Impellers of Cement Plants, Power Plants, etc, As well as for Balancing of the Rotors weight upto 5 tons at rated speed of 1500 RPM and 3000 RPM also.

The main advantages of horizontal balancing machines in comparison to other types of balancers are:

- Produces highest accuracy
- Virtually all types of rotors can be balanced on these models
- Components with its own journals can be balanced without tooling
- Easy access for loading and correction
- Large weight capacity

Case Study:-

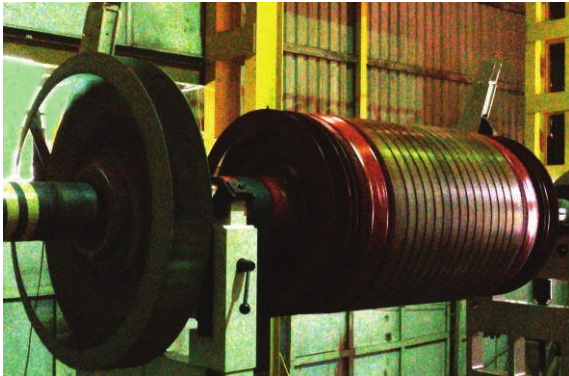
The below left image shows typical job weight having 14 Tons being attended by us for L & T through their vendors.

Machine Capacity

- WEIGHT: 30 kg to 30 Tons
- LENGTH UPTO: 10.5 Mtrs
- DIAMETER: 4200mm



In House Dynamic Balancing



Installed Machine suitable for Jobs Balancing at rated speed of 1500 RPM and 3000 RPM.
Capacity– 30 Kg to 5,000 Kg **SCHENCK**.

On this H 70U / BU+CAB690 Machine, we can balance any Rotors weight upto 30 tons at low speed and rotor weight upto 5 tons of 2 Pole, 3000 rpm / 4 Pole, 1500 rpm/ 6 Pole, 1000 rpm can balance at Rated Speed, as per Clients' requirements.

Rigid Rotors & Flexible Rotors Balancing:

- The Rotors which do not change shape when speed of rotation increases, or the ones which do not operate at resonant frequency, are classified as rigid Rotors.
- Flexible Rotors are Rotors which operate near their resonant frequency. This running of motor generates very slight deformation of the Rotor. Flexible Rotors need to be balanced at higher speeds and also near their service speeds.

Balancing Capacity at Rated Speed

- WEIGHT: 30 kg to 5000 Kgs
- LENGTH up to: 3 Mtrs

ADDITIONAL RESOURCE & FACILITY AVAILABLE WITH US.

Transportable Balancing Machine Capacity 100 tons

We have resources and facility for balancing Jobs at your factory site anywhere in India by Transportable (Mobile) Hard Bearing Balancing Machine, Model HT 100 of **SCHENCK** for Rotors weighing up to 100 Tons.

Any big Rotor can be balanced at Site. By availing this special facility, Customers can avoid transportation time, handling, transportation cost and down time. Thus, this facility will give the Organization a big saving.

The Rotors such as Turbine, Hydro-Turbine, and Kiln Rotors for cement Plants can be balanced on this Machine

In House Dynamic Balancing

Table : Balance quality grades for various groups of representative rigid rotors (From ISO 1940/1)

Balance Quality Grade	Product of the Relationship ($e_{\text{per}} \times v$) ^{(1) (2)} mm/s	Rotor Types - General Examples
G 4 000	4 000	Crankshaft/drives ⁽³⁾ of rigidly mounted slow marine diesel engines with uneven number of cylinders ⁽⁴⁾
G 1 600	1 600	Crankshaft/drives of rigidly mounted large two-cycle engines
G 630	630	Crankshaft/drives of rigidly mounted large four-cycle engines Crankshaft/drives of elastically mounted marine diesel engines
G 250	250	Crankshaft/drives of rigidly mounted fast four-cylinder diesel engines ⁽⁴⁾
G 100	100	Crankshaft/drives of fast diesel engines with six or more cylinders ⁽⁴⁾ Complete engines (gasoline or diesel) for cars, trucks and locomotives ⁽⁵⁾
G 40	40	Car wheels, wheel rims, wheel sets, drive shafts Crankshaft/drives of elastically mounted fast four-cycle engines with six or more cylinders ⁽⁴⁾ Crankshaft/drives of engines of cars, trucks and locomotives
G 16	16	Drive shafts (propeller shafts, cardan shafts) with special requirements Parts of crushing machines Parts of agricultural machinery Individual components of engines (gasoline or diesel) for cars, trucks and locomotives Crankshaft/drives of engines with six or more cylinders under special requirements
G 6.3	6.3	Parts of process plant machines Marine main turbine gears (merchant service) Centrifuge drums Paper machinery rolls; print rolls Fans Assembled aircraft gas turbine rotors Flywheels Pump impellers Machine-tool and general machinery parts Medium and large electric armatures (of electric motors having at least 80 mm shaft height) without special requirements Small electric armatures, often mass produced, in vibration insensitive applications and/or with vibration-isolating mountings Individual components of engines under special requirements
G 2.5	2.5	Gas and steam turbines, including marine main turbines (merchant service) Rigid turbo-generator rotors Computer memory drums and discs Turbo-compressors Machine-tool drives Medium and large electric armatures with special requirements Small electric armatures not qualifying for one or both of the conditions specified for small electric armatures of balance quality grade G 6.3 Turbine-driven pumps
G 1	1	Tape recorder and phonograph (gramophone) drives Grinding-machine drives Small electric armatures with special requirements
G 0.4	0.4	Spindles, discs and armatures of precision grinders Gyroscopes

1) $v = 2\pi n/60 \text{ } \dot{A} \text{ } n/10$, if n is measured in revolutions per minute and v in radians per second.

2) For allocating the permissible residual unbalance to correction planes, refer to "Allocation of Uper to correction planes."

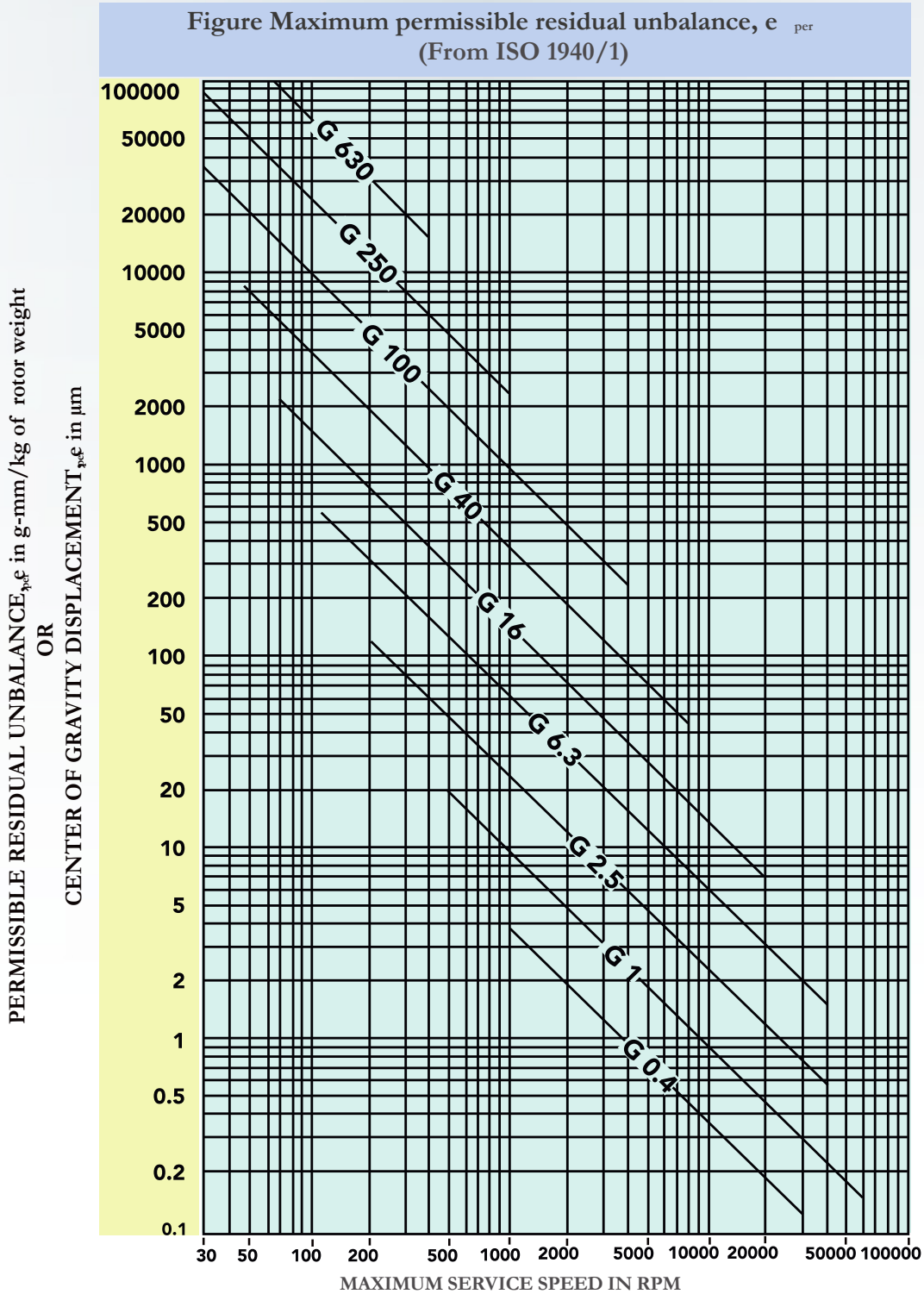
3) A crankshaft/drive is an assembly which includes a crankshaft, flywheel, clutch, pulley, vibration damper, rotating portion of connecting rod, etc.

4) For the purposes of this part of ISO 1940/1, slow diesel engines are those with a piston velocity of less than 9 m/s; fast diesel engines are those with a piston velocity of greater than 9 m/s.

5) In complete engines, the rotor mass comprises the sum of all masses belonging to the crankshaft/drive described in note 3 above.

In House Dynamic Balancing

Figure : Maximum Permissible residual unbalance



Permissible residual unbalance calculation will be :

$$\frac{\text{Displacement in microns (as per graph)} \times \text{Weight of the Rotor in kg}}{\text{Correction Radius in mm}}$$
 Therefore, Permissible Unbalance = (xyz)

Condition Monitoring, Vibration Analysis & Onsite Balancing



12



Any Rotor will run trouble-free for a certain period of time, or under specific operating conditions. There are every chances that, un-balance will occur while working, which may result in damage to the Machine and break-down of the installation.

We offer quality Vibration Analysis services a complete range of services to diagnosis, troubleshoot and correct machine condition regularly as well as annual maintenance contract [AMC]. Vibration Analysis can be the most valuable tool for predictive and preventive maintenance which will determine the health condition of Machines. Under AMC we carry out condition Monitoring Job on equipment & submit a detailed report along with recommendation. Based on which further plan for Analysis, required rectifications & Balancing is decided. We provide complete range for On-Site Balancing services of all type of rotary machines like ID/FD Fans, Centrifugal Basket assembly, Cooling Tower fan assembly, Turbine Alternators, Fibrizor Rotor assembly etc.,. On site balancing provides a practically efficient method for test facilities, assembly and plant maintenance to balance complete rotor assembly in position. We will follow the Overall vibration measurement in accordance with IS 11724, ISO 2372, BS 4675 or VDE 2056 Standard Specifications..

The below left image on this page shows Site balancing carried out by us on Induction Motor assembly, for one of our reputed Clients DOL Electric Private Ltd. who is a leading Rewinder / repairer of Motors, Generators etc.,.

Vibration Severity Chart & Other Guides



Case Study:-

The first image, on page alongside shows typical job of Condition Monitoring & Vibration Analysis of 12 MW DG Genset, attended by us at Bhushan Steel plant at Khopoli (M.S) India. The second image shows Site balancing of Cooling Tower fan attended at the Site of BOC India Limited at Tarapur.

We will assess the vibration level as per following standard. Overall vibration measurement in accordance with IS 11724, ISO 2372, BS 4675 or VDE 2056 Standard Specifications..

VIBRATION CRITERION AS PER VDI 2056, ISO 2372, BS 4675 STANDARDS

Vibration Severity Criteria for evaluating condition for Machines running at the frequency of 10 Hz to 1000 Hz. Example of these types of Machines are small, direct-coupled Electric Motors and Pumps, Production Motors, Medium Motors, Generators, Steam and Gas Turbines, Turbo Compressors, Turbo Pumps and Fans. Some of these Machines can be coupled rigidly or flexibly or connected though gear. The axis of Rotating Shaft may be horizontal, vertical or inclined at any angle.

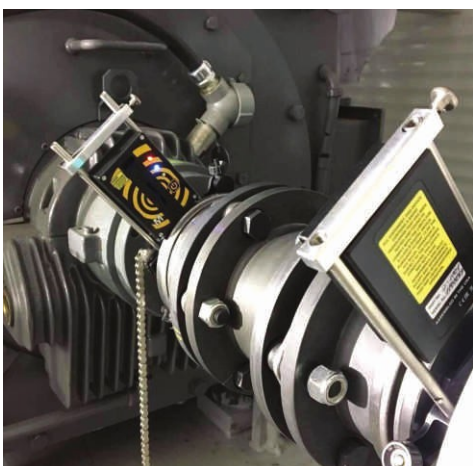
The below given chart helps us to evaluate the condition of over all vibration level as per VDI 2056, ISO 2372, BS 4675 STANDARDS depending upon the power rating of the Equipment. Based on the same, assessment of the Equipment can be done and its condition can be classified and known.

The Vibration Severity Ranges in accordance with ISO 2372

45	Not Permissible	Not Permissible	Not Permissible	Not Permissible
28				Just Tolerable
18	Just Tolerable	Allowable	Good	Just Tolerable
11.2				Allowable
7.1	Allowable	Good	Large machines with rigid and heavy foundations whose natural frequency exceeds machine frequency	Allowable
4.5				Good
2.8	Good	Medium machines 15 - 75 kw or up to 300 kw on special foundations	Large machines operating speed above foundation natural frequency (e-g Turbo machines)	Good
1.8				Good
1.12	Good	Small machines up to 15 kw		Good
0.71				
0.45				
0.28				
0.18				
	Class I	Class II	Class III	Class IV

A typical example is the Standard VDI 2056. The vibration amplitude of the Machines during smooth operation can be taken as "Good" classification. The vibration criteria suggests that successive vibration increase of about 2.5 times will be more than the vibration condition from "Good" to "Allowable", to "Just Allowable", to "Not permissible".

Laser Alignment Service



We offer a complete range of services for Laser Alignment for all types of Rotating Machines in Horizontal, vertical / flange-mounted and Cardan-shaft-coupled drive.

We have instrument with program feature to undertake Alignment Jobs. Correct Alignment helps to prevent vibration, Machine break down, Production loss, Bearing failure etc. We are providing regular alignment & Vibration Consnultancy Services for Viraj Steel Plants, Cabot India, Hi- Tech Carbon, Jindal Steel Plants, Glasstech India Glass Company etc.

We have modern Tools to carry out such jobs on Pumps, Motors, Altenators, Cooling Tower Assembly, Turbines, Spindles, etc,. We render these Services for various Clients all over India and abroad.

Alignment Services are done on :-
Pumps, Motor / Alternators / Gear Boxes / Cooling Tower Assembly / Turbines / Spindles and any type of drive and Machine Assembly

ADVANTAGESOFLASERALIGNMENT

Perfectly aligned Machines reduce vibration, Machine breakdown, Production loss, Energy consumption, failure of Bearings and other parts, Coupling wear, Shaft Breakage. The ultimate advantage being LONG AND TROUBLE FREE MACHINE PERFORMANCE

Rotor Repairs & Services



We undertake turnkey projects for Rotary Equipment right from Condition Monitoring / Analysis to complete repairs / refurbishment / replacement of parts till final Vibration test to assess the final result.

We also carry out all types of Rotor Repair Services, like complete fabrication, Repair of damaged fans, Blowers, Pumps etc. We also undertake repairs, hard facing, special welding and machining of Rotary Equipment. Prior to taking up Dynamic Balancing, we check the trueness, run out, fitment, of the rotors and prepare a detailed report to ensure that the rotors are perfectly alright for use. If anything is found abnormal, we inform the Clients for taking corrective action. We are fully geared up to undertake such rectification Jobs. Every Rotor which is repaired or rebuilt by ROKADE RotoTechniks is precision balanced to ensure smooth and quiet operation and maximum life.

We have completed Shaft Repairs of Vertical Pump Impeller by Colomonoy Coating Process of FLOWSERVE Make, for Ratnagiri Gas and Power Limited. (Joint Venture of NTPC & GAIL), Dabhol Power Plant, Dist – Ratnagiri.

Case study:-

The middle image shows a similar type of job undertaken by us on Pump assembly for BMC Matunga Pumping station. On initial analysis the Vibration level found was above 50 mm/s and as per our assessment root cause was found to be shaft bend as well as system un-balanced. Accordingly it was attended and final result on the assembly pump overall vibration was less than 2.5 mm/s.

The left below image shows PIERALISI, Decanter Scroll completely repaired by us by Stellite Hardface welding including balancing for Mother Dairy Foods Processing Ltd.

The image alongside shows Vertical Bowl Separator reconditioned and Balanced by us for Mark Technologies, Mumbai.

OUR BRANCHES:

THANE

5, UK, Ind. Estate, Behind Durian Furniture,
Pokharan Rd, No. 2, Thane - 400 601 (M.S)
Tel:- 022- 21737777 / 78 / 79, 21737788

MUMBAI

5/A Wing, Bharat Indl Estate, Off. Lake Rd,
Opp. Hind Rectifier Co. Bhandup (W)
Mumbai – 400 078 (M.S)
Tel:- 022 – 25968814

NAVI MUMBAI

Plot No. R- 375, T.T.C. Indl Area, Rabale,
Navi Mumbai - 400 701 (M.S)
Tel:- 022 - 27602001 / 27602002

PUNE

Gate No # 256, Indrayani Estate, Jyotibanagar,
Talawade, Pune 412 112 (M.S)
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www.rokaderototechniks.com
Www.accuratebalancing.com

OUR REGIONAL TEAM :

GUJARAT | CHATTISGARH | ODISHA | JHARKHAND | HARYANA | HIMACHAL PRADESH |
KARNATAKA | ANDHRA PRADESH | WEST BENGAL

