2020 Vol. 1

SCHENCK

balancing news

Information for the quality and performance of rotating equipment from SCHENCK USA CORP.

Meet Lars Kuenne President & CEO, of SCHENCK USA CORP.

... " DIGITALIZATION AS A CORNERSTONE OF SUCCESS THAT CONTINUES TO GROW."

— by Dee Loebl, Marketing, Sales Administrator

IN THIS ISSUE:

Lars Kuenne enjoys meeting people and his open-mindedness to expand horizons discovering and learning about the concepts and cultures of regions all over the world has helped him to understand them. Broad travel formed the foundation of the idea of sharing cultures, and professional accomplishments and technical education provide enthusiasm and gratification, and he sees the progress of the company in digitalization as a cornerstone of success that continues to grow.

Born in Hamburg, Germany's second largest city, Lars lived there for only eight months, and his family moved to Tanzania where they lived for six years. There, was his first exposure to a new culture, where he learned to appreciate cultural differences while traveling throughout East Africa, and then they returned to Germany to reside in the city of greater Frankfurt.

In 2004, while completing his studies, in Mechanical Engineering at Technical University (TU) Darmstadt, Lars worked at Siemens Campus in Erlangen, Germany, and had interviews scheduled with many large corporations in addition to Schenck. The blend of the job description at Schenck and the company itself automatically won him over to say "they really gave me such a good feeling" and he knew his decision to work at Schenck would be the right one. Lars enjoys the mix of technology, international presence and the interaction with various cultures worldwide.

Lars began his career at Schenck as Project Manager in the Automotive sector in 2004 with growing responsibilities, leading to his appointment as Service Director in 2012. He earned additional responsibilities in the sales area in 2016 for the Europe, Middle East and Africa market, and with three years in universal machines (standard balancing machines), steering him to become the President and CEO of Schenck USA Corp. in 2018.

Lars and his family reside in Long Island, New York. His children learned English very quickly and began their preschool education shortly in four to six weeks after arriving in the summer of 2018. Lars enjoys spending time with them hiking and cycling together. He has played soccer and tennis, and presently likes running. Prior to having a family, Lars and his wife travelled frequently.

He achieves the balance of professional and family life where each day at home communication is priority as they gather together at the dinner table leaving the later part of the evening to complete his work.

A tradition in his family and a quote Lars appreciates is "Only when you start to work on something, you can finish."

ONE SCHENCK USA Strategy Continues

MERGERS STREAMLINE AND STRENGTHEN OUR ORGANIZATION

Over the past year, we have intensified our ONE SCHENCK strategy!

This merger streamlined and strengthened our presence in the North American Market, expanding our field service capabilities and

Deer Park, NY

Southfield, MI

Hudson, MA

It all began, on February 1, 2019, when we happily announced our one SCHENCK USA initiative. Schenck Corp. of Deer Park, NY, merged its US subsidiaries, Schenck Trebel Corp. (Deer Park, NY) and Schenck RoTec Corporation (Southfield, MI) to form SCHENCK USA CORP. (Deer Park, NY), a wholly-owned subsidiary of Schenck Corporation.

combining our expertise under one defined entity. Both locations in Deer Park, NY, and Southfield, MI, remained active under SCHENCK USA CORP., with no changes to current contact partners maintaining their operations both in Southfield, MI, and Deer Park, NY.

Then, on February 1, 2020, we proudly announced the continuation of our ONE SCHENCK USA strategy with the merger of the legal entity TEST DEVICES INC. (TDI) of Hudson, MA, into SCHENCK USA CORP. of Deer Park, NY, operating as TEST DEVICES a business unit of SCHENCK USA CORP., with premises remaining in Hudson, MA, with our Mr. David Woodford remaining the President.

The successful TEST DEVICES brand remains an integral part of our business, with continued focus on offering spin testing (pre-spinning and development testing), semi-finish machining, and balancing services, as well as supplying specialized spin testers, providing a “One-Stop-Shop" to the aerospace industry.

Today, our ONE SCHENCK strategy continues to strengthen, and to culminate this, we are pleased to announce, on July 31, 2020, Schenck México, SA de CV merged into the company DÜRR de México, S.A. de C.V.

We wish Juan Pablo and his team, continued success in their new home!

This new merger builds a more efficient organizational structure in Mexico to meet the interests of our employees, customers, and investors in the best possible way. Synergies of finance and administration with seamless accounting and service departments consolidate functions, and we benefit from improved work processes.

For over several decades in Mexico, and for more than 100 years over the world, we proudly continue the use and presence of our SCHENCK, AGRAMKOW and DÜRR brands. Presently, we have over 40 locations worldwide offering new machines, upgrades, balancing services, filling, assembly and test systems, including parts, service and training seminars, serving the electrical, automotive, turbomachinery, aviation, space, general industries and their suppliers.

Sales Teams from SCHENCK USA locations met together July 2019 at Deer Park, NY

from One SCHENCK to SCHENCK ONE

NEXT LEVEL BALANCING STARTS HERE!

SCHENCK ONE Digital Solutions

We were pleased to announce, effective on May 11th this year, SCHENCK ONE as the new brand name for Schenck Digital solutions.

Schenck ONE Smart Applications brings us to a new level of balancing by combining applications that enable customers to easily access their production and machine data and carry out extensive analysis. This empowers customers to improve balancing processes by utilizing the full potential of their data, which is accessible from anywhere at any time. Applications available are the Smart Cockpit Dashboard and the Rotor Data Center.

The Smart Cockpit Dashboard offers a comprehensive overview of each individual machine and is used for organizing and optimizing your entire machine pool. You have quick and easy access to critical machine information with current and historical data and contact details to your Schenck service channels.

The Rotor Data Center application automatically collects all rotor-related parameters safely and securely in a centralized location, where files can be searched, sorted, compared and exported through a paperless process.

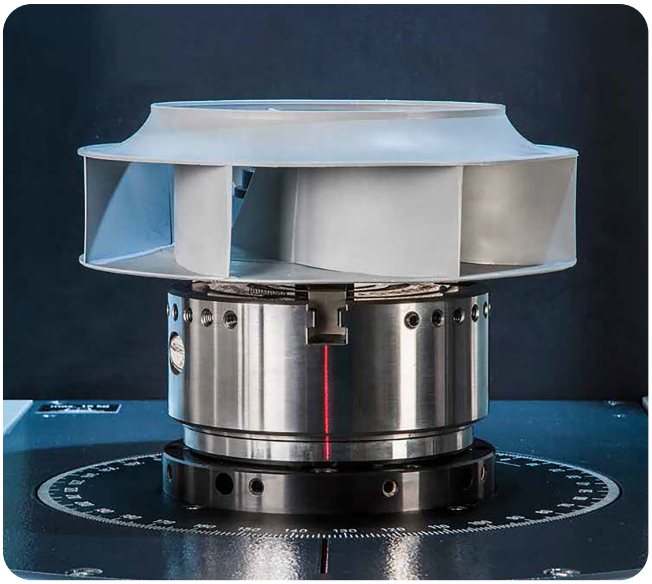
for SCHENCK ONE: Contact us Here

Balancing to API Specification

AMERICAN PETROLEUM INSTITUTE (API) STANDARDS

A Pump and Compressor Balancing Maintenance Reminder

— by Joseph Palazzolo, Product Manager, Universal Machines



SCHENCK Virio 15 (Vertical Balancing Machine) shown with Impeller

Balancing of pump impellers, shafts, multistage assemblies, compressors and expanders, for the petroleum, chemical, and natural gas industries generally involves following the outlined approaches defined in various API Standards such as API 610, API 617 and API 684. Among other topics, these documents discuss component balancing, assembly balancing, flexible rotor balancing, as well as unbalance verification testing.

Your preferred API document / specification may include an introduction to balancing terms and definitions, as well as figures and images to help visualize types of unbalance and typical bending mode shapes.

Some introductory topics for consideration by the balancing machine operator, repair and overhaul engineer, or product design engineer, becoming familiar with the API specification, and how it relates to dynamic balancing, are the single plane and two plane balancing recommendation, the API standard balance tolerance specification, permissible mass eccentricity and fit eccentricity related unbalance and tooling error. These topics are helpful reminders for either the balancing of new product, or for repair and overhaul.

For component balancing of centrifugal pumps, API Standard 610 has identified a "rule of thumb" for determining if a component, such as an impeller, may be balanced in a single plane. The ratio between the outer diameter and the width across that diameter is compared. If the diameter is "D", and the width of the rotor is "B", then a component may be single plane balanced if the ratio of D/B is 6.0 or greater. **Example:** If an impeller has a 10 inch diameter, and is 1.5" in width, the ratio of 10/1.5 = 6.66. This is greater than 6.0, so a single plane balance could be acceptable. This rule of thumb is a convenient method to determine if a major rotating component can be balanced in one or two planes. The one plane balancing, or static balancing, is used for components that have a narrow balance plane separation that makes two plane, or dynamic, balance impractical.

The API Standard Balance Tolerance is defined as the maximum allowable residual unbalance per correction plane, while at the same time it must be realized that in order to achieve these low residual unbalance levels that will result in low vibration levels at assembly also requires tight manufacturing and machining tolerances. It must be realized what can be feasible and practical, at the same time as economical.

The API Standard 610 states that impellers and other components shall be dynamically balanced to an ISO Quality Grade of G1 (equivalent to "4W/n" in US Customary terminology). In actuality, the "4W/n" balance tolerance equates approximately to an ISO grade of 0.7. Users of the API Standards must be aware that the "4W/n" tolerance is also defined as the unbalance per plane (in units of oz-in) and that the **"W"** equates to the load in pounds per balancing machine journal. (For symmetrical rotors, the W will represent ½ the total rotor weight). The "4W/n" tolerance is suitable for a rotor / component assembly. However, if the rotor, or component, is being balanced using a balancing arbor, it may be feasible to balance to 4W/n, but it should not be assumed. The equivalent permissible mass eccentricity should be considered. If the mass eccentricity associated with the unbalance is so small that if the component is assembled and disassembled from the arbor that the residual eccentricity cannot be maintained, then the 4W/n should not be used. It may be that an "8W/n" (nominally equivalent to ISO G 2.5) should be used. To support this, ISO 21940-1 indicates that tolerances less than G2.5 would not be repeatable for components that will be dismantled and remade.

The potential maximum component to arbor fit-up error can be greater than the balance tolerance / permissible eccentricity. The on/off repeatability can be greater than the tolerance that is needed to be met. In this case, where the rotor needs to be removed from the arbor and reinstalled for corrections to be made, a reliable correction process cannot be completed with each reassembly of the rotor onto the balancing arbor.

SCHENCK Virio (Vertical Balancing Machine) shown with Pump Impeller

Example: The maximum potential component to arbor fit up error takes into consideration the maximum bore diameter possible for the component and the minimum arbor dimension, or fit clearance. For a typical application, this fit clearance could be 0.0005".

Alternatively, the fit up between the component and arbor can create an overall component runout (TIR) of 0.0005".
The mounting errors between the component and arbor cause a radial displacement of the component / a runout (TIR), of ½ the fit clearance, or 0.00025". This is also described as the potential maximum eccentricity.

The maximum fit up error between bore and arbor of 0.0005" also equates to a radial displacement of the component of 0.00025".

Assume:
Rotor Mass: 280 lb (4480 oz)
Max. Service Speed: 1750 rpm
Static (single-plane) Balance
Calculated Balance Tolerance: [(4 (280 lb)] / 1750 rpm = 0.64 oz-in
Component to arbor fit-up error (tooling error): 0.0005" (Or, TIR of assembly: 0.0005")

Where:
U= Unbalance
W = rotor mass,
e = eccentricity (1/2 TIR, or radial displacement of fit up / rotor fit clearance)

U (oz-in) = W (oz) x e (inches)
Balance Error = 4480 oz x .00025 in = 1.12 oz-in

Error from the tooling to component fit up (1.12 oz-in) is greater than the rotor's calculated balance tolerance of 0.64 oz-in

Note: If the fit up error, or TIR, were as low as 0.0002" (which is precise for dimensional features to be held), the error from the fit up would account for approximately 70% of the calculated balance tolerance.

U (oz-in) = W (oz) x e (inches)
Balance Error = 4480 oz x .0001 in = 0.45 oz-in
Calculated Balance Tolerance: [(4 (280 lb)] / 1750 rpm = 0.64 oz-in

This scenario results in 70% of the tolerance already used up by tooling and mounting errors, leaving the balancing machine operator to balance each component to 0.64 – 0.45 = 0.19 (oz-in) or better, to be sure that the maximum permissible residual unbalance of 0.45 oz-in will be attained in the final assembly.

How the calculated tolerance relates to the balancing machine you select to use can also be significant. Considering only the mathematics, the 4W/n tolerance calculation has no lower boundary, and can approach zero as the denominator (n), which is the maximum rotational service speed, increases. This can become more common as manufacturers, and machine designers, are developing rotor assemblies to be lighter and run at higher speeds, to improve overall efficiencies. The calculated balance tolerance should be converted to its equivalent permissible eccentricity based on the rotor's mass, and considered against the assembly and machining tolerances, bearing running clearances, as well as the balancing machine's lower limit.

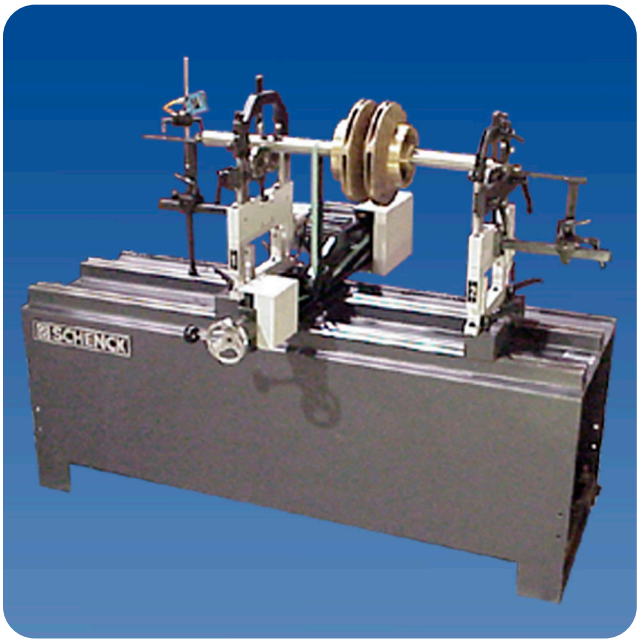
It must be noted that any balancing machine will have physical limitations with regards to a lower limit of permissible residual unbalance. This lower limit is a practical limit for a new machine, as well as for a machine under normal use. The smallest measurable unbalance in a balancing machine is 5 microinches to 10 microinches. In other words, the minimum achievable residual unbalance under ideal rotor conditions, same as the maximum sensitivity, will not be better than 0.000 005 inches of displacement of CG.

(Multiply by weight of rotor in grams to obtain minimum achievable residual unbalance in gram-inches.)

Although the 4W/n calculated tolerance, for a lightweight component, or assembly, with a higher maximum operating speed, could result in a tolerance in oz-in that once converted to permissible eccentricity / minimum achievable residual CG displacement by dividing by the rotor weight, can equate to an eccentricity of less than 10 microinches. This may not be able to be repeatable, run-to-run on either bare rotor journals, on a balancing arbor, or as an assembly with service bearings installed. Note that the running clearance of the service bearings may be greater than the calculated rotor's permissible CG eccentricity. These bearings will not maintain the rotor's central axis of rotation to within the permissible eccentricity / CG displacement.

If any of these above factors are ignored, this can result in excessive balancing time attempting to achieve an artificially low balance tolerance. This can also lead to overcorrection, and "chasing", of the correction at an extremely low permissible eccentricity, causing excessive material removal, aesthetics issues with the component, and possibly degrading the structural integrity of some components.

The API standards for balancing of pump impellers, shafts, multistage assemblies, compressors and expanders provide a great outline for developing a balancing procedure, but if certain factors are overlooked, or not considered, the outcomes can be non-desirable to the user.



SCHENCK Horizontal Balancing Machine shown with impellers

Recognition in the Global Supply Chain

WE ARE HONORED TO BE PART OF THEIR FRONTLINE HEROES TEAM

HDT GLOBAL

30500 Aurora Road, Suite 100, Solon, OH 44139 ▪ P: 216.438.6111 ▪ F: 440.248.1691

hdtglobal.com

August 4, 2020

Subject: Coronavirus (COVID-19) Supplier Update

Dear Valued Supplier,

We would like to take this opportunity to recognize and thank our suppliers for their dedicated partnership as we deal with the impact of COVID-19. As an essential supply chain partner to the Military and Government, HDT has remained committed to keeping our production lines running since March 2020. As we continue to supply expeditionary products and solutions for critical infrastructure sectors, we are also proud to support the pandemic response with COVID-related products within our communities.

Without a doubt, HDT relies extensively on its supply chain network to meet our customers' requirements across the globe. Through these challenging times, our supply base has stayed the course and worked tirelessly to maintain supply in support of our most critical customers. Although the world is far from dealing with all of the impacts caused by this global pandemic, we are sincerely appreciative of your continued support through these unprecedented circumstances.

Finally, we would like to share a communication received from the United States Department of Defense addressed to the Defense Industrial Base (DIB) workforce. Please share this letter within your organization to further convey not only our appreciation, but also the appreciation of the U.S. Department of Defense.

Best Regards,

Andrew T. Youngberg
Strategic Director of Supply Chain

Mark Weiler
Tactical Director of Supply Chain

Letter of Appreciation from HDT Global

Letters of Appreciation

HDT Global recognizes and thanks their suppliers for their dedication and partnership in their continued support to maintain supply to their most critical customers during these unprecedented circumstances.

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION
AND SUSTAINMENT

JUL 17 2020

Dear Defense Industrial Base Workforce:

We in the Department of Defense would like to express our sincerest appreciation for your commitment to and focus on maintaining the Nation's defense industrial base. You are our everyday heroes and we thank you.

As Secretary Esper mentions in his short video that can be viewed on defense.gov, "You've worked hard to preserve engineering and manufacturing operations, keep our supply chains functioning, and maintain our ships and aircraft." Every frontline worker plays an integral role for the Nation and our partners and allies. As our competitors seek to use this moment of uncertainty to their advantage, it is your unwavering commitment that has helped us support the Warfighter, modernize the force, and preserve readiness.

Across the Department, we have taken steps to help businesses—big and small—withstand the uncertainty associated with the current national emergency. At every leadership level within DoD, we have made important policy changes to mitigate impacts by speeding up payments to increase cash flow and taking steps to provide personal protective equipment, where possible, among many other efforts.

Secretary Esper puts it best, "Thanks to you, we are able to continue to execute our national security missions and maintain our military superiority." We will continue to serve alongside you, helping in every way we can. Together we will persevere and emerge stronger than before.

Sincerely,

Ellen M. Lord

Letter of Appreciation from the Department of Defense

Virtual Support Service Group

CALIBRATION SERVICE | TROUBLESHOOTING SUPPORT

Scheduling a Remote Video Session is Easy!

SCHENCK USA is now offering Remote, Contact-less, Service Support for your Universal Balancing Machines.

Customers can utilize their laptop webcams (preferred), smart phones or tablets to work live with a service member to complete their annual calibrations, perform remote support or schedule short webinars on specific topics.

SCHENCK USA is keeping all of our customers up and running without having to risk any health or safety by traveling or visiting the facility.

Click Here: Schedule your Virtual Appointment

Welcome to the SCHENCK ACADEMY

ONLINE TRAINING SEMINARS | WORKSHOPS

SCHENCK USA CORP. offers online training seminars and workshops presented in an interactive environment ranging from beginner to the advanced theory level.

From your computer or other web-enabled electronic device, demonstrations and practical hands-on training make it possible to practice the skills you've learned while you are learning them. Please visit our website to learn more about the courses we offer and our Balancing Certification Program.

View: Seminar Overview & Course Descriptions

SCHENCK

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