SIMULATION

OF HANDLING EQUIPMENT

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FASTER TIME 2 MARKET
with simulation

Valid for:
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THANK YOU
FOR CHOOSING US

Simulation helps a lot when it comes to finding better solutions and eliminating rework on the shopfloor. The functional evaluation in product development or the simulation of moving parts in automation technology is particularly useful. To serve this purpose, RNA DS offers a vast portfolio of proprietary and proven simulation tools.
Our goal is to make simulation simple, fast and accessible so that special machine builders can successfully solve their clients' complex tasks.

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SIMULATION IN EVERYDAY ENGINEERING

TECHNOLOGY, EXAMPLES, ADVANTAGES & BENEFITS

Building better solutions faster with less rework on the shopfloor: Nowadays a must in the ever advancing field of bespoke automation.
To serve this purpose, RNA DS has developed proprietary simulation tools. With the help of our software Digital Feeder and Digital Motion RNA engineers evaluate the functionality of their designs and digitally optimize the running characteristics of the installed drive units. To avoid premature failure during operation, we use FEM for structural-mechanical validation.

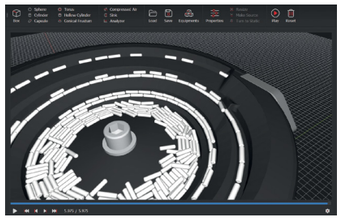
The simulation tools Digital Feeder und Digital Motion are completely developed inhouse and well-proven in the daily business.

Digital Feeder is used for the evaluation of feeding systems and all other handling systems. Digital Feeder is particularly helpful when it comes to developing completely new products, see e.g., Case Study #2.

Digital Motion can be used to calculate the running behavior of the RNA drive units. Thanks to Digital Motion, the typical trial-and-error on the Shopfloor is no longer required to achieve a smooth and consistent running feeding system.

PRACTICAL USE CASES

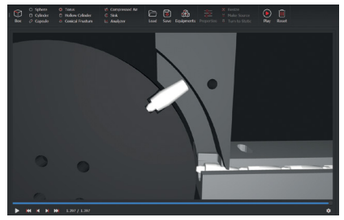
Simulation as easy as child's play.



FEEDING SYSTEMS

Evaluate your feeding systems

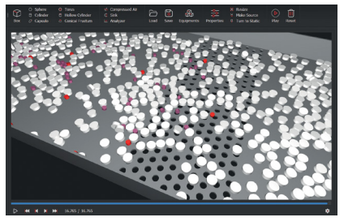
Many feeding technology manufacturers rely on RNA components. They can now use simulation studies to evaluate their designs and digitally adjust the drive units before the system is built. The commissioning time is shortened, and rework is avoided.



SEPARATION

Interface to the separation unit

Customers often buy feeding systems with a free outlet and develop the separation unit themselves. This critical interface between the linear feeder and the customer's separation unit can be reviewed with simulation, reducing the commissioning time on the ShopFloor.



PRODUCT DEVELOPMENT

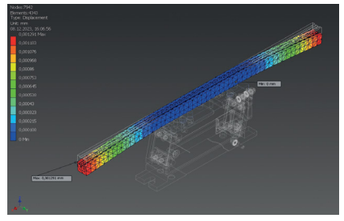
Build less prototypes

Special machine builders are faced with various evaluation tasks when developing new products: Does the parts-pusher work as planned? Is there a parts jam at the interface or do the parts feed in correctly? Can the position be accurately detected with a sensor? All these questions can be answered easily with simulation.

TRAINING MATERIAL

Upgrade your training material

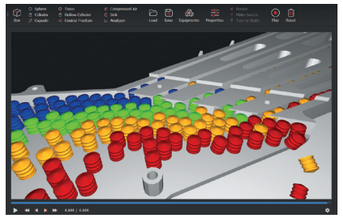
Employees are a companies most valuable asset. In times when it is hard to find skilled personell, it is of utmost importance to educate new colleagues in the best possible way. Simulation is a key contributor when it comes to building up experiences and understanding technical contexts quickly.



FEM

Make sure your design lasts

Downtimes due to broken mechanical components are avoidable. FEM can be used to assess whether the machine can withstand the dynamic loads in everyday production as early as the design phase. The probability of premature failure can thus be minimised.



TOLERANCE ANALYSIS

Increase your process stability

The OEE of the real system depends heavily on the quality of the parts to be handled. Simulation studies can be used to determine which tolerances on the feeding parts are still permissible without impairing the process stability of the feeding system.

CASE STUDY #1

DEVELOPMENT OF FEEDING SYSTEMS

CUSTOMER:
Rhein-Nadel Automation

USE CASE:
Functional evaluation

DEPLOYMENT:
Daily

Simulation everyday

The use of simulation has become an integral part of RNA's day-to-day business and an important contributor to securing margins.

How does a feeding part behave in the feeding bowl, in which orientations does it run along the feeding track? Does the sorting unit work as planned or are there jams? What effect do tolerances have on the feeding parts? How should the drive unit be adjusted to ensure smooth running behaviour? The RNA Group answers all these questions on a daily basis using Digital Feeder and Digital Motion, completely without sample parts or prototype construction.

Our simulation software with its sub-modules is used permanently in day-to-day business.

SALES

Even in the early phases, simulation provides valuable insights when planning feeding systems. How many feeding parts fit into the hopper? How does the feeding part behave in a similar feeding system? By answering these questions with the aid of simulation, every project is steered in the right direction right from the start.

ENGINEERING

Simulation is used daily in the development of feeding systems at RNA. Every feeding system that has been designed in CAD can easily be simulated. On average, 500 feeding systems per year are simulated and their function is optimised before production. By iteratively alternating between CAD and simulation, feeding systems with high availability and performance are created. The development starts completely without real sample parts.

COMMISSIONING

Commissioning benefits from simulation in three ways. First, commissioning time is reduced by finding and eliminating errors in the digital world. Second, the simulation helps colleagues in the workshop to understand the behaviour of the feeding parts. Third, thanks to Digital Motion the drive units are delivered preadjusted and correctly pre-assembled to the workshop, which also saves commissioning time.

FACTS

500+
Feeding systems simulated per year

36
Daily users in the design departments on average

100%
Better coordination in day-to-day business

Visualization enhances the communication between customer, development and commissioning

DEVELOPMENT OF A SEGMENT FEEDER

CASE STUDY #2

CUSTOMER:
Arnold Umformtechnik

USE CASE:
Simulation studies

DURATION:
12 months

SUPPORTING PRODUCT DEVELOPMENT WITH SIMULATION

Bringing a new product to market is a major challenge. Simulation helps to keep iteration cycles short and prototyping lean.

Arnold Umformtechnik, part of the Würth Group, manufactures fasteners and associated processing machines of the highest quality, primarily for the automotive and electrical industries. During the development of a new segment feeder, Digital Feeder helped to optimize the product design in terms of availability, performance and susceptibility to faults.

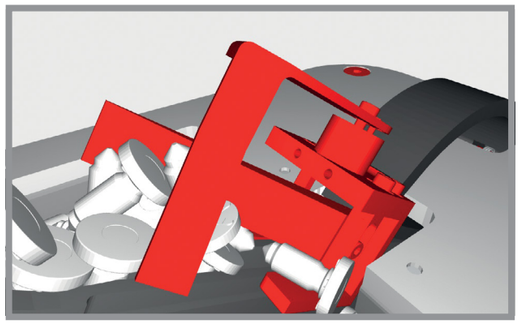
FASTER AND BETTER PRODUCT DEVELOPMENT
WITH SIMULATION MODELS IN DIGITAL FEEDER

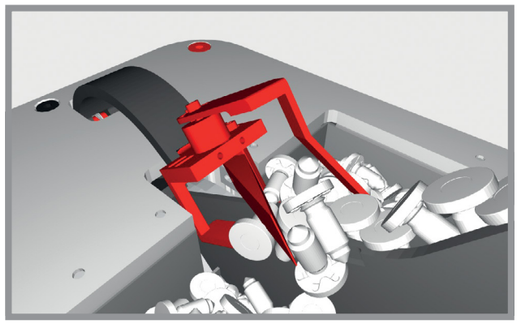
PROTOTYPING
costs time and money

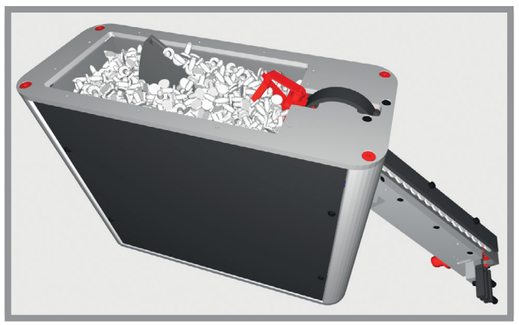
Different designs can be easily validated in the simulation. The geometry of the scooping segment has been optimised in such a way that a wide range of different fasteners can be fed in the best possible way and the deflector does not cause any jamming. Dead spots in the operating area have been eliminated and the filling volume maximised.

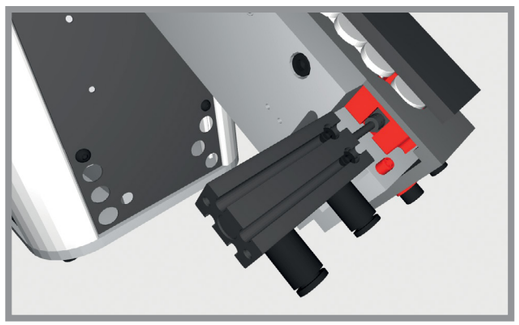
INCREASED PROCESS STABILITY
thanks to digital and real-world test cases

In the digital world, product development can be safeguarded with an almost unlimited range of different products to be handled. All relevant properties of the parts can be taken into account: Materials, tolerances, threads... The machine behaviour is thus simulated very realistically and potential faults are detected reliably.









DIGITAL TWIN
as a basis for future evaluations

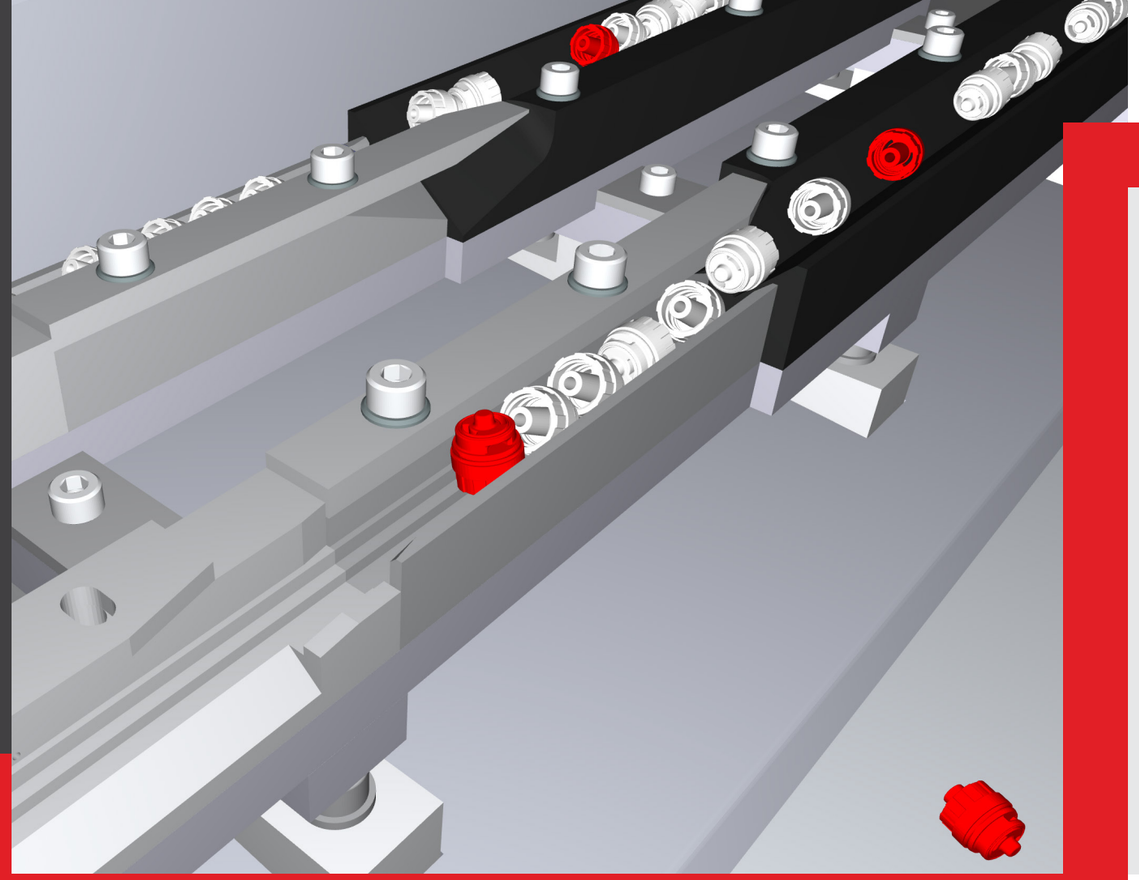
Can the newly developed fastener be fed using the existing segment feeder? How many of the customer's feeding parts can the segment feeder store? Thanks to the simulation model in Digital Feeder, the evaluation of such questions no longer requires a real test and the reliability in sales increases.

VISUALIZE AND UNDERSTAND
the inner workings of the machine

In the simulation, the functionality and problem areas of the product can be observed in detail, from different perspectives and in slow motion or sped up over time. Employees and end users can thus be optimally trained and easily gain a deep understanding of the system.

EFFECTS OF THE FEEDING PART'S TOLERANCES

CASE STUDY #3



CUSTOMER:
Electronics industry

UMFANG:
Simulation study of part's tolerances

DURATION:
3 weeks

CLOSER TO THE REAL WORLD

More stable processes thanks to simulation when handling parts with tolerances.

The actual feeding parts or handling parts often do not correspond to their technical drawings. If the production machine is planned purely on this basis, extensive adjustments may be necessary during commissioning.

With the help of simulation, we can model parts with a wide range of tolerances and evaluate how different tolerances influence OEE and performance. Simulation studies are worth their weight in gold, especially when coordinating with the supplier of the parts.

5 STEPS TO SUCCESS

01 Project goal

Together we define the objective of the simulation study: product development, separation simulation, drive unit tuning, FEM...

- Goal
- Timeline
- Required data

02 Exchange of data

In the second step you send us data: CAD, information on materials, description of motions, tolerances...

- Gather data
- Clean data
- Enrich data

03 Simulation setup

Our engineers set up the simulation model with your data and carry out initial plausibility tests.

- Parameterising
- General conditions
- Plausibility checks

04 Simulation runs

The longest step, depending on the task. We derive specific recommendations for your development.

- Evaluate functionality
- Determine performance
- Derive recommendations

05 Results

The results are discussed with you and a results report is submitted.

- Discussion
- Documentation
- Implementation

! TIP:

Simulation.

Becomes a child's play.

As a user of **www.designforfeeding.com** you can start directly with step 2 and easily order predefined simulation studies online.

RNA
Digital Solutions

THANK YOU

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