

# BendingStudio

The software platform for all data and processes around the manufacturing of bended parts



SOLUTIONS FOR BETTER BENDING



# BendingStudio

It takes several steps to go from a drawing to a finished tube or wire and each step requires its own type of data. AICON's BendingStudio software platform links all the data and processes involved in the production of bended parts – from production and process planning to manufacturing and quality control. Particularly in combination with Tubelnspect and Movelnspect, BendingStudio offers efficient and customer-oriented solutions for all applications in bending production.

## Optimized data handling for every production step

Although everyone involved is talking about the same part, different groups require different data: CAD data from design engineering, bend programs and correction data for production, test and inspection plans for quality control, analysis and reports for management. But these data sets are not always compatible.

## BendingStudio in tube production

Bended pipes and tubes are found everywhere. Often invisible to the casual observer, they are indispensable for the function of many devices in day-to-day life and in industrial production. Brake and fuel lines, exhaust systems or air conditioner lines in automotive engineering; hydraulic pipes in aircraft, ship or machine construction; tubes in the production of furniture and housewares – innumerable pipes and tubes of all sizes, diameters and forms are bended and processed.



## The right solution for every user

The users at the different process steps have different requirements. When measuring during production, the operator only wants to see the parts that are actually being bended, to carry out the measurement at a push of a button and to immediately have the most important results displayed. During planning and analysis, on the other hand, complex data have to be clearly presented and edited.

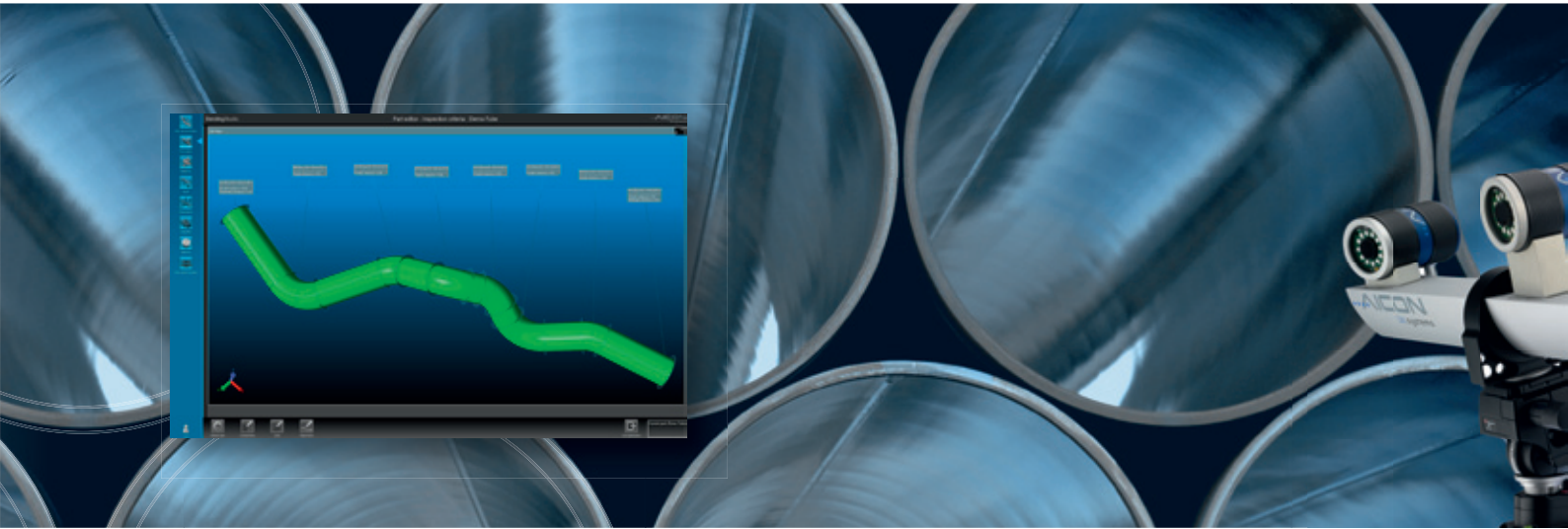
BendingStudio offers every user the environment tailored to his needs.

## Pipe production at the highest stage

Constantly increasing product quality requirements combined with rising cost pressures increase the demands for cost-effective production. BendingStudio allows efficient quality control of bended tubes. At the same time, the software provides the right tools for linking all data involved in production – from drawing to bending program through to measurement log.

Even though there are great differences in the processes between one-off production, (e. g. in prototype construction, small batch production with frequently changing parts) and mass production with 100 % testing, BendingStudio guarantees optimum data management at all times. Even for incoming part inspection or initial sampling, BendingStudio is the key to lean measuring and production processes.

The software platform for all data and processes around the manufacturing of bended parts



### Simple operation in a complex environment

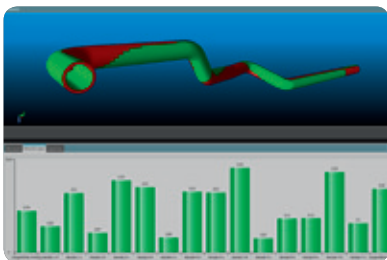
Inspection and measurement during production have to be quick and easy. Thanks to BendingStudio, a part can be selected and measured with just a few clicks. The deviations are displayed clearly and comprehensibly to enable quick evaluation. The generated test plan always has the same appearance, regardless of whether the data come from TubelInspect, MoveInspect or another measuring system.

### Efficient production control

Time is money, particularly during production. BendingStudio and TubelInspect guarantee quick production control. With bend corrections from the module BD-CORRECT and the corresponding interfaces to the bending machines, BendingStudio minimizes machine down times and bad parts.

### BendingStudio in quality assurance

Inspection against drawing is crucial in quality assurance. The modules GAUGE and INSPECT allow the form of the tube to be checked against specifications. Features for process and production analysis and interfaces to SPC systems are also available.



Graphical output allows the user to quickly judge whether a tube is within tolerance or not.



### Versatile application around wire bending

At first sight, bended wire looks just the same as bended tube. And indeed, many processes involved in wire and tube bending are very similar. But wire reacts differently to bending than tubes or pipes. For example, tighter radii can be bent. That influences the bending technology employed and often allows shorter production cycles.



### Quickly from drawing to first part

Particularly during prototyping or at the start of a series production run, new parts have to be run-in on the bending machines. BendingStudio offers efficient tools to quickly generate an initial bending program from the wire running data. But often the material cannot be molded as required, and the bending process has to be corrected. Since wire is frequently bended with free radii, the module BD-FREEFORM together with the module BD-CORRECT can quickly calculate the necessary corrections and transmit these to the bending machine. BendingStudio thus enables a much faster production release.

### Highest standards on smallest parts

Smaller diameters, higher precisions – small bent wire parts are particularly challenging in production. Many of these parts are defined by means of functional dimensions such as distances, angles or other form and position tolerances. The solution: BendingStudio and the module INSPECT together with TubelInspect HD or TubelInspect HS provide the basis for inspection against drawing.



# The solution for every measuring system.



## BendingStudio connects:

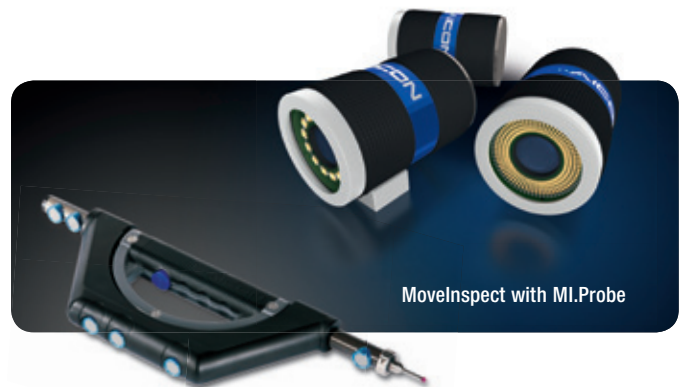
- CAD Data
- Production control systems
- Bending machines
- Measuring systems
- Statistical process control

## Your benefits:

- Effective data handling
- One software for all users
- Faster from drawing to part
- Higher productivity
- Proven part quality

## Different measuring systems, the same analysis

From the prototype through to the series production component, the same parts should always be tested in the same way. But in practice things look quite different: diverse test equipment such as coordinate measuring machines or gauges produce different information for one and the same part. Sometimes this is due to the orientation; sometimes it is because different features are tested. With BendingStudio it is possible to link the test plans drawn up for the part to different measuring devices – always ensuring that the measuring system has the necessary capabilities.



TubelInspect



## BendingStudio and TubelInspect

What good is a powerful data and process platform without a powerful measuring system? AICON's TubelInspect offers efficient quality control in tube and wire production. It is fast, accurate, flexible and very easy to use. TubelInspect is completely integrated into the BendingStudio environment. It takes advantage of the innovative data management, the extensive software tools and the vast array of analysis possibilities, which are all geared precisely to the specific demands around bending.

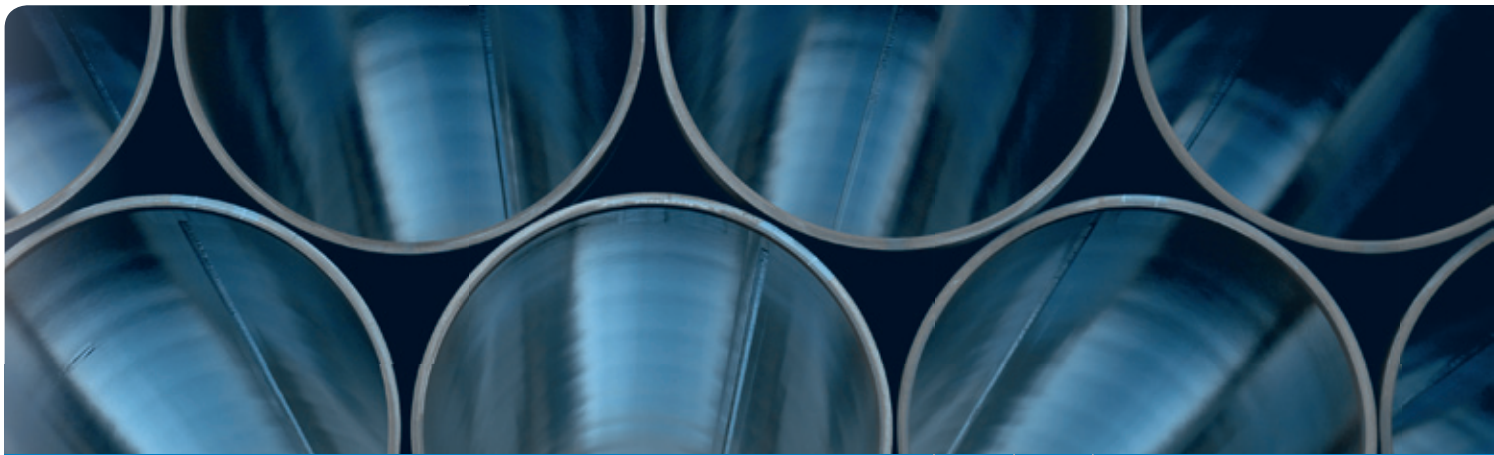
## BendingStudio and MoveInspect

With BendingStudio, AICON's MoveInspect HR portable coordinate measuring machine also becomes an efficient tube measuring device. MoveInspect with MI.Probe functions like a measuring arm, but is far more flexible in use. In contrast to the measuring arm, the system can be configured according to the object size and required accuracy. Even tubes with large diameters, e. g. from shipbuilding or plant engineering, can be easily tested in this way.

## BendingStudio stand-alone

In some areas such as job preparation, measuring technology and quality assurance do not have priority. BendingStudio as stand-alone software offers a wide range of solutions, even without interfacing to a measuring system. And if an AICON measuring system is not available, measurement data from various measuring systems can be transmitted to BendingStudio via open data interface and then evaluated.

# BendingStudio | Modular Structure



Modules		Base	Option	Comments
BASE	Part database, editor, material database, user management	●		
GAUGE	Virtual gauge, sheath tolerance for center line and bending points	●		
INSPECT	Inspection of functional dimensions		●	
BD-CLASSIC	Calculation of bending data with fixed bending radius	●		
BD-FREEFORM*	Calculation of bending data for freeform bending programs		●	
BD-CORRECT	Determination of bending corrections, application of corrections, correction simulation, open data interface to bending machines		●	
BRANCH*	Branched pipeline systems		●	
STATISTIC*	Evaluation of measurements series, process monitoring	●		
REPORT	Viewer, protocol generation	●		
Tools				
FLEX-STANDARD	Deflection correction		●	Currently for BD-CLASSIC only
FLEX-STRETCH*	Stretching of hose components		●	
ASSEMBLY	Position and location of fixings, flanges and attachments, management of measuring tools		●	
BUILD	Construction of bending programs from measurement or CAD data		●	
Interfaces				
TUBEINSPECT	Interface to TubelInspect systems	●		
MOVEINSPECT	MI.Probe Wizard	●		
OPENPOINTS	Import of measurement points from external data sources	●		
CAD Interfaces	IGES Import*/Export, STEP Export		●	Further interfaces in progress
BENDER Interfaces	Available for many types and manufacturers of bending machines		●	Please ask for available interfaces
SPC Interfaces	QS-STAT		●	Further interfaces in progress

\*Available from Q3/2013

## BendingStudio

Solutions for better bending

### The AICON Philosophy

Efficient and high-precision production monitoring, quality control and quality assurance are absolutely essential to be competitive in a global market.

In the field of measuring technology, optical and portable non-contact 3D measuring systems become more and more important. We offer optimized solutions around your measuring and inspection procedures to keep the quality of your products always at the maximum level.

MEASURE THE ADVANTAGE



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