

Engineering – Metrology – Workshop - CNC

Services

Small part mechanical measurements and reverse engineering

Large and very large measurements

Reverse engineering services

Tool designing



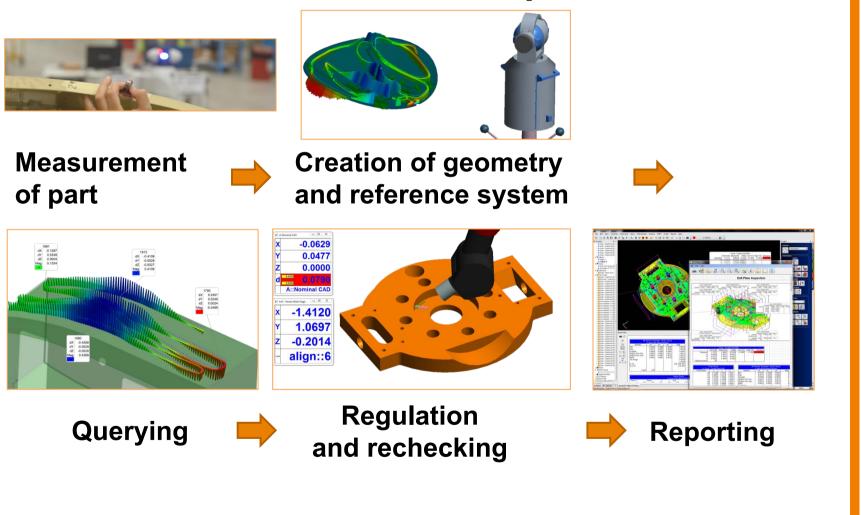


Fields of applicaction

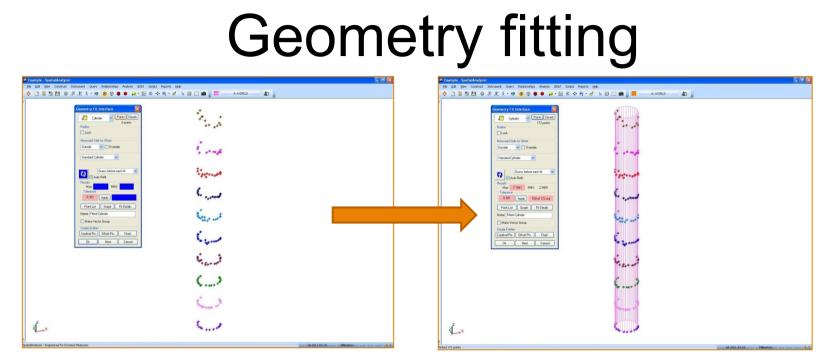
- Aerospace
- Automotive
- Oil and gas
- Energy
- Shipbuilding
- Metallurgy
- Machined parts



Measurement process







With our software we can create any basic geometry. The creation of geometry can be done immediately.

With Spatial Analyzer software we could create points like:

- Centers of circles, cyliders,
- · Centroids of planes,
- Center of lines, etc.

And then compare them.



Querying

npla1-SpatialAnalyzer Edit Yew Construct Instrument Query Relationships												-
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Avg 0.000 StdDev from Zero: 0.060												
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Show Fractions	P3 -	1275.523	3129.882	-239.325	1275.523	3129.882	-239.257	0.000	-0.000	0.068	0.068	
Set Base Color Report Colorization	P4	1683.570	2918.323	-239.950	1683.570	2918.323	-239.912	0.000	-0.000	0.038	0.038	
	PS	2012.211	2606.938	-240.598	2012.211	2606.938	-240.634	-0.000	0.000	-0.036	-0.036	
Update Menu Close	P6	2232.510	2248.785	-241.186	2232.510	2248 786	-241.234	-0.000	0.000	-0.049	-0.049	
	97 98	2363.269 2359.131	1814.330 1387.586	-241 762 -242 196	2363.289 2359.131	1814.330 1387.586	-241.861	-0.000	0.000	-0.098	-0.098	
	P0 P9	2258.576	958.905	-242.534	2358.577	958.905	-242.454	0.000	-0.000	0.084	0.080	
	P10	2076.798	573.349	-242,750	2076.798	573.348	-242.662	0.000	-0.000	0.009	0.089	
	P11	1701.050	230.460	-242.790	1781.050	238,460	-242.756	0.000	-0.000	0.042	0.042	
	P12	1405.078	6.835	-242.661	1406.078	6.835	-242.613	0.000	-0.000	0.049	0.049	
	P13	987.953	-125,210	-242.379	987.953	-125,218	-242.355	0.000	-0.000	0.024	0.024	
	P14 P15	538.578 145.027	-138.808 -33.426	-241.944	538.578 145.827	-138.808 -33.426	-241.980	-0.000	0.000	-0.036	-0.036	
	P15 P16	-258,731	-33.426	-241,443	-258.732	167.038	-241.531	-0.000	0.000	-0.000	-0.072	
	P10	-506.530	451.045	-240.213	-586.530	451.045	-240.505	0.000	-0.000	0.101	0.101	
	P18	-816.072	800.125	-239.626	-816.072	800.125	-239.553	0.000	-0.000	0.073	0.073	
	P19	-953.899	1241.550	-239.035	-953.899	1241.550	-238.985	0.000	-0.000	0.050	0.050	
	P20	-973.702	1691.389	-238.553	-973.702	1691.389	-238.522	0.000	-0.000	0.031	0.031	
	P21	-070.549	2103.593	-238.225	-070.549	2103.593	-230.224	0.000	-0.000	0.001	0.001	
	P22 P23	-672.594 -398.635	2504.552 2820.530	-238.019 -237.969	-672.594 -398.635	2504.552 2820.530	-237.992 -237.936	0.000	-0.000	0.027	0.027	
	P23 P24	-398.635	3079.174	-237.969	-398.635	3079.173	-237.936	0.000	-0.000	0.052	0.052	
		432.526	3071.431	-238.542	432.526	3071 431	-238.500	0.000	-0.000	0.033	0.033	
	PI		3088,294	-238.929	836.889	3088.294	-238.916	0.000	-0.000	0.013	0.013	
		836.889				2994.900	-239.403	-0.000	0.000	-0.056	-0.056	
Z	P1 P2 P3	1238.585	2994.979	-239,426	1238.585							
ž	P1 P2 P3 P4	1238.585 1598.526	2994.979 2003.895	-239.982	1598.526	2803.895	-240.044	-0.000	0.000	-0.062	-0.062	
Z X	P1 P2 P3 P4 P5	1238.585 1598.526 1907.586	2994.979 2003.895 2520.204	-239.982 -240.582	1590.526 1907.586	2803.895 2520.204	-240.652	-0.000	0.000	-0.070	-0.070	
z x	P1 P2 P3 P4	1238.585 1598.526	2994.979 2003.895	-239.982	1598.526	2803.895						

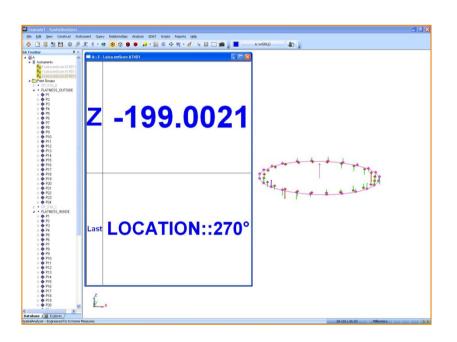
With our software we can easily do any comparation between every geometry we created.

For best results we are applying envoirmental factors as temperature and air pressure.

We could apply any material constants that could affect measurement, We own excessive database of materials, as well as, we could create new ones.



On-site regulation



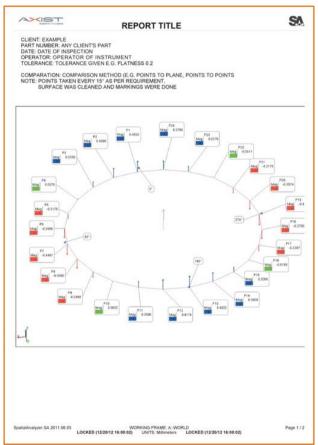
Thanks to Spatial Analyzer we could provide on-site real-time machines regulation.

Our instruments allow us to operate with contstant stream of data so we do not need to analyze it after it measurement.

Thanks to this functions we could save huge amount of time.



Reporting



We are providing clear reporting with any information that our Client require.

With our software we can clearly show which parts of measured item are wrong and which are in tolerance field. It is clearly stated through colour indication.



Our equipment



Laser Trackers:

- Leica Laser Trackers •
- Faro Laser Tracker •
- **API Laser Tracker** ٠



Poli-articulated arms:

- Faro Arms (Titanium and gold) ٠
- Romer Arms ٠



Photogrammetry



Laser radar



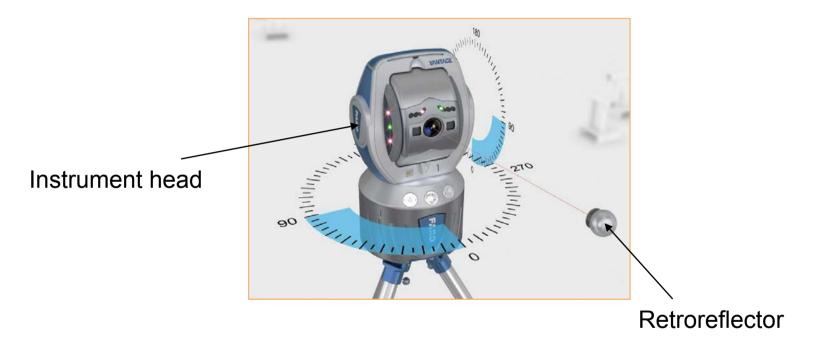


Industrial Total Stations: Leica





How it works? Laser Tracker



All the theory end up with checking the distance (time of laser beam reflection) between the head and the retroreflector.

Head can operate in 360 deg. as showed.



How it works? Industrial Total Station





Retroreflector



Instrument head

Total Station works with IR (infared) instead of laser for checking the distance between the head and the retroreflector.

Thanks to using the retroreflector instead of reflective tape we can acquire greater precision than most of the companies using only reflective tape.

With Total Station it is possible to check parts with good precision up to 500 m. Also the envoirment influence is, in case of Total Station, mininal compared to Laser Tracker.

Head can also operate in 360 deg., same as Laser Tracker

Oil and gas industry

We are keeping in touch with biggest oil and gas companies.

Our services included:

- Measurement of very large structures (legs, water and oil tanks, oil platforms)
- Alignment of cranes, platforms and much much more

For accurate measurements we are using:

- Laser Trackers (1-160 meters)
- Total Stations (2-500 meters)







Energy

We are providing dimensional services also in the energy industry.

We have outstanding experience in measuring such parts as: water turbines, various tanks and other big structures.

Some of many of our clients:

- DACTEK
- VOITH SIEMENS
- ALSTOM POWER
- ANSANDO ENERGIA

We are providing services with: laser trackers, total stations.



Automotive

Due to our extensive cooperation with such companies as:

- FIAT Group
- Iveco
- Porsche
- Comau
- Kuka

we are able to offer highest quality of dimenional inspection within the automotive industry.

We are offering services in use of:

- CMMs
- Laser Trackers
- Poli-articulated Arms





Aerospace

Our services include:

- Assembly rectification
- Dimensional checks
- Tools' creation and correction

We are using in this field:

- CMMs
- Laser Trackers
- Poli-articulated arms

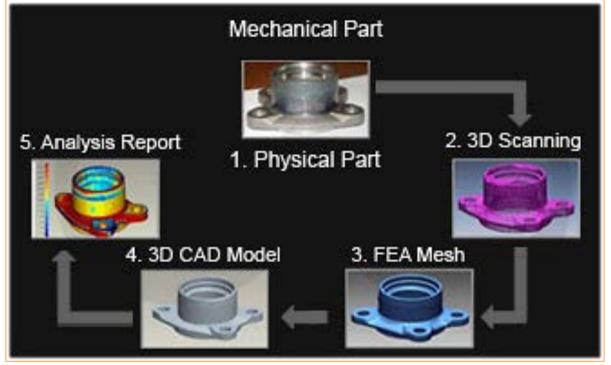
We are working with such companies as:

- Boeing
- Airbus
- AgustaWestland
- Alenia
- Tawazun Precision Industries
- STRATA





Reverse engineering



We are providing full reverse engineering services, from scanning actual part, through creation of model, up to analisis.



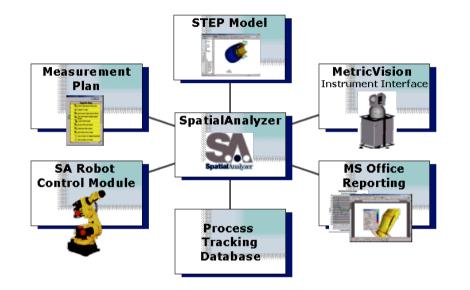
Tool designing / manufacturing



We are in possesion of well-equipped workshop, thanks to this and our experience we are able to offer wide variety of services in tool design and manufacturing.



Software



We are in possesion of licences of Spatial Analyzer and we are its authorized reseller.

For the designing and measurement purposes we have CATIA V5 licenses.







ALTO has been working with the main Aerospace Companies such as:

ALENIA AERONAUTICA	Alenia Aeronautica
ALENIA AERMACCHI	
AGUSTA WESTLAND	AgustaWestland
ALSTOM	ALSTOM
AIRBUS	SAIRBUS
THE BOEING COMPANY	BOEING ®
ENEL	met Enel
FBM KNM FZCO	СОТИТАТИИ FBM-KNM FZCO

ALTO LLC

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metrology - workshop - jig&fixture - composite



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LOCKHEED MARTIN	
	LOCKHEED MARTIN
MAGELLAN	MAGELLAN
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SALVER	
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THALES ALENIA	
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