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Time study comparison for the implementation of ONGAA CAM

A comparison of labour input for product design, CNC programming and CNC production using ONGAA CAM for Solidworks versus the previous system of design in AutoCAD with manual CNC programming with WoodWOP

Previous Method of CNC Production - Manual

Product engineering and client presentation and shop drawings were developed using an AutoCAD 2D drawing package. Due to the custom nature of Windowcraft products, individual drawings are required for each product assembly. Each drawing was then interpreted by the CNC programmer to extract the required data to manually create numeric programs in WoodWOP for each part in the assemblies. Parametric WoodWOP programs were developed for standardized products, DXF conversion used for complex shapes, and nesting was manually performed using WoodNEST basic.

New Method of CNC Production - ONGAA CAM

Product engineering, client presentation and shop drawings are developed with SolidWorks 3D basic drawing package. Individual drawings are still required for each product assembly. With ONGAA CAM, CNC programming is applied directly to the Solidworks Model by the draftsman/CNC programmer, WoodWOP part programs are generated automatically from the models in Solidworks and Parametric models are created for standardized products and nesting is automated within ONGAA CAM.

Product Test Sample

For this study a variety of products were selected that represent a typical product mix for Windowcraft. Sample products selected were actually produced with design and programming time recorded. Estimates based on previous experience were used to calculate manual programming times. Results are shown in table below

Number	Product Type	<u>% of product produced requiring custom programming in addition to Parametric programming</u>		<u>Product type % of total sample - machine production time</u>	<u>Product type Design time savings</u>	<u>Product type Program time savings</u>	<u>Product type Production time savings</u>
		<u>Customized</u>	<u>Parametric</u>		<u>%</u>	<u>%</u>	<u>%</u>
1	Standard entry systems	10.00%	90.00%	5.13%	70.00%	73.48%	0.98%
2	Shape entry systems	70.00%	30.00%	8.75%	26.67%	56.55%	1.94%
3	Specialty entry systems	90.00%	10.00%	7.00%	9.17%	52.15%	1.94%
4	Standard casement windows		100.00%	9.15%	78.33%	81.40%	0.99%
5	Shaped casement windows	50.00%	50.00%	4.20%	43.33%	56.46%	1.94%
6	Replica sash windows	50.00%	50.00%	10.08%	44.44%	58.01%	1.94%
7	Standard hung windows		100.00%	13.51%	76.67%	72.82%	0.99%
8	Shaped hung windows	60.00%	40.00%	6.98%	34.29%	31.45%	1.94%
9	Shutters		100.00%	3.12%	53.33%	57.83%	0.99%
10	Standard Cabinetry		100.00%	6.31%	89.69%	83.30%	1.16%
11	Specialty Cabinetry	75.00%	25.00%	9.65%	22.92%	60.99%	2.60%
12	Face frame Cabinetry	40.00%	60.00%	5.65%	58.33%	50.26%	2.91%
13	Stile and rail door	10.00%	90.00%	2.08%	82.50%	66.67%	0.99%
14	Specialties	70.00%	30.00%	8.40%	27.50%	56.15%	0.98%
		100.00%					
Weighted Average time savings based on total sample (weighted on % total machine production time)				46.05%	61.95%	1.62%	

Study Summary

The implementation of ONGAA CAM as a complete design to machine method of CNC production has realized many advantages for Windowcraft

Average Programming time reduced by 61.95% Through parametric programming without the need to manually regenerate programs one by one

Average Design time reduced by 46.05% Through parametric modeling which can be re used complete with CNC programming already in place

Average CNC machine time reduced by 1.62% Through reduced part re make due to typographical errors inherent to manual numeric programming

Other Benefits

Implementation of ONGAA CAM has allowed Windowcraft to essentially eliminate the need for dedicated WoodWOP programmer skills. Instead, the application of machining processes to the Solidworks model is accomplished by the Solidworks modeler at the time of design. Without the need to learn a new program interface and the ease of applying machining processes within ONGAA CAM, the learning curve for our draftsman was extremely short.

With ONGAA CAM's machine origin selection feature, throughput for machine time has been maximized with multi part, simultaneous part processing without additional programming time required for inverted, mirrored origin programs.

With ONGAA CAM Windowcraft has been able to expand its product offering to include products such as case goods not traditionally offered due to a lack of specific skill set on the production floor. Product engineering and part program verification within the Solidworks environment with 3D shop drawing presentation, has allowed our production and assembly team to easily adjust to new and different product types.