UGS CONNECTION

AMERICAS 2008

Simple Tool Management from Excel

Klaus Gorm Jensen
Project Manager
LEGO Company
Denmark
Mail : kgj@LEGO.com

Agenda

- 1. A few words about my self
- 2. The Tool Shop
- 3. The processes around Tools
- 4. What we need – Functional spec.
- 5. What the system must deliver
- 6. Workflow
- 7. Live Demo
- 8. Techniques
- 9. Questions?

1. A few words about myself.

- Unigraphics responsible LEGO – based in LEGO Engineering. LEGO has about 130 users on NX4.
- I Have worked with CAD/CAM since 1983 – Unigraphics from 1986.
- Have done a lot of Grip / GripNC programming to automate things earlier – still doing a little when we need something fast without database access.
- Waiting for NX6 – I have done programming in RubyOnRails to present legacy data in a more process oriented way.
- Education: Master of science in Power Engineering.

2. The Tool Shop.

- 120 production Moulds in hardened steel per year.
- 3 Mikron 400 5 axis – 68 tools
  Equipped with Palette (min 20 pallets)
- 3 Mikron 600 3 axis – 58 tools
- The department is driven by delivery of moulds with short lead time driven by Lean methods
- No Rules - but Guidelines
- In this world Tool managements is considered as waste time

  Show me tool data management from excel !

The processes around Tools.

- We use Tools for with conical shank for High Speed Milling
- When we load the machine we import all tools available on the machine
- HSM milling in hardened steel demand often adding of new tools to improve the process
- Feed & Speed setting
- Mount the tool in the holder
- Mount the tool in the machine

What we need – Functional spec.

- Tools with conical shank - independent of Holder
- Specify which machines tools are mounted on
- Specify holder depending on machine
- Good overview of tools - easy administration
- Overview of Feeds & Speed - easy administration
- Specification sheet for mounting tools in holder
- Specification sheet for placing tools in machine
- Easy update of all seed parts, template parts
- Test environment
- Procedures for releases from preparation to test and production environment
- Procedures for Backup of data

  Necessary Data organized in a spreadsheet

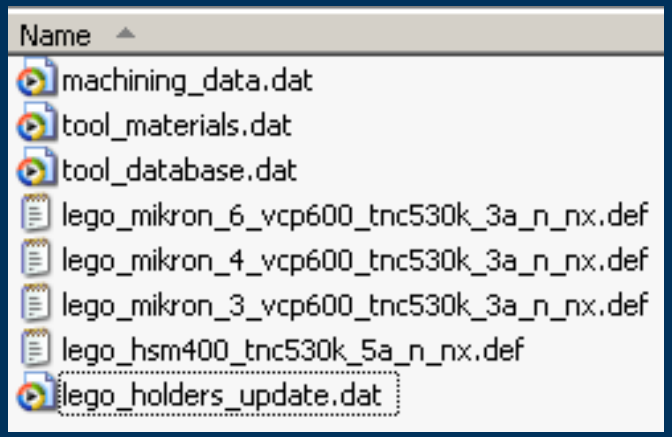
Tool mounting in holder

Only show relevant data

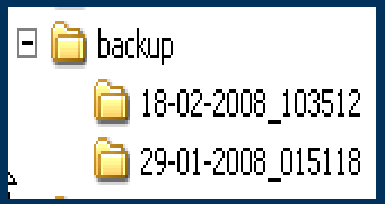
					KGJ						Mikron 1/2 (HSM400)			Mikron 3	
	Tool Type	Sub Type		T No.	Tool Name	Lenght	Height, Cylindrical	Flute length	NoFlutes	Type og shankt ø	Pos	Holder	Holder Offset	Pos	Holder
DATA	T	ST	LBNR	TLNUM	DESCR	L3	HEI	FLEN	FN						
DATA	2	1	1023	4	EM_1.0_F6_U25	25	6	1,6	2	EPDS-2010-6-Ø4	44	40Exdia4	0	10	63Exdia4
DATA	2	1	1003	5	EM_1.0_F8_U30	30	8,5	1,6	2	DES-2010-8.5C-Ø4	45	40Exdia4	0		63Exdia4
DATA	2	1	1033	6	EM_1.0_F10_U30	25	10	2	2	DES2010-10C-Ø4	46	40Exdia4	0	29	63Exdia4
DATA	2	1	1022	10	EM_2.0_F16_U25	25	14	3	2	DES-2020-7C-Ø4	57	40Exdia4	0		63Exdia4
DATA	2	1	1053	11	EM_2.0_F20_U35	35	20	3	2	DES-2020-10C-Ø4	11	40Exdia4	0	30	63Exdia4
DATA	2	1	1237	32	EM_2.0_R0.2_F12_U25	25	12	1,7	2	EPDR-2020-12-02-ø4	2	40Exdia4	0	32	63Exdia4
DATA	2	1	1214	15	EM_3.0_F15_U30	30	15	5	2	DES-2030-5C-Ø6	15	40Exdia6	0	31	63Exdia6
DATA	2	1	1213	50	EM_3.0_R0.2_F12_U30	30	12	2,5	2	EPDR-2030-12-02-ø4	7	40Exdia4	0	33	63Exdia4
DATA	2	1	1192	42	EM_2.99_F15_U25	25	15	15	2	CEPL-4030-Ø6	51	40Exdia6	0	3	63Exdia6
DATA	2	1	1007	17	EM_4.0_F20_U35	35	20	5	2	HPSLN-2040C-Ø6	17	40Exdia6	0		63Exdia6
DATA	2	1	1193	43	EM_3.99_F20_U30	30	20	20	2	CEPL-4040-Ø6	66	40Exdia6	0	4	63Exdia6
DATA	2	1	1221	19	EM_5.99_F30_U34	34	30	25	6	CEPL-6060-Ø6	19	40Exdia6	0	55	63Exdia6
DATA	2	1	1128	20	EM_6.0_F15_U30	30	15	6	2	HES-2060-C-Ø6	68	40Exdia6	0	34	63Exdia6
DATA	2	1	1225	27	EM_6.0_F30_U30	30	30	16	2	HES-2060-C-Ø6	61	40Exdia6	0	40	63Exdia6
DATA	2	1	1149	48	EM_6.0_R1.5_F25_U25	25	25	12	4			40Exdia6			63Exdia6
DATA	2	1	1150	49	EM_6.0_R1.5_F40_U40	40	40	12	4			40Exdia6			63Exdia6

What the system must deliver.

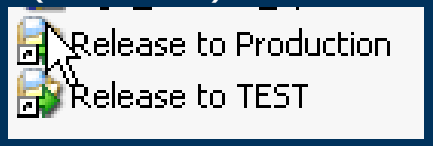
Værktøjsliste Mikron 1 og 2						18-02-2008 10:35	
T Nr.	Plads	Fræser navn i UG	Fræser diameter	Udhæng L3	Frislibning L1	Type og skaft ø	Holder
4	44	EM_1.0_F6_U25	1	25	6	EPDS-2010-6-Ø4	40Exdia4
5	45	EM_1.0_F8_U30	1	30	8,5	DES-2010-8.5C-Ø4	40Exdia4
6	46	EM_1.0_F10_U30	1	25	10	DES2010-10C-Ø4	40Exdia4



Backup:



Release (bat-files):



Workflow

	A	B	C	D	E	F	P	Q	R	S
1								Mikron 1/2 (HSM400)		
2		Tool Typ	Sub Type		T No.	Tool name in NX	Type and Shank DIA	Seat	Holder	Offset
3	DATA	T	ST	LBNR	TLNUM	DESCR				
5	DATA	2	1	1023	4	EM_1.0_F6_U25	EPDS-2010-6-Ø4	44	40Exdia4	0
6	DATA	2	1	1003	5	EM_1.0_F8_U30	DES-2010-8.5C-Ø4	45	40Exdia4	0
7	DATA	2	1	1033	6	EM_1.0_F10_U30	DES2010-10C-Ø4	46	40Exdia4	0

1. Visual basic macro exports to 2 csv-files and saves backup.

2. Print Lists for tool mounting.

machining_data.csv
Tool_data.csv

3. Tcl formats postprocessor def-files, tool_materials.dat, tool_database.dat, machining_data.dat, lego_holders_update.

LEGO_tool_lib.tcl
lego_machining_data.tcl
LEGO_Pock_Write.tcl
LEGO_read_file_write.tcl

5. Release to TEST

Release to Production
Release to TEST

4. Check log files

```
Program ending reading Tool_data.csv, found eof
ier=0
```

tool_database.dat-err

toolupdate.dll

6. Update tool data on NX parts – (userfunction)

Demo

UGS CONNECTION AMERICAS 2008

- Tool T43 (1193) Dia 3.99 -> 3.98
  Fz: 0.0312 -> 0.035

- New Tool replaces T15 on
  Mikron 3 + Mikron 4
  Length 30->28

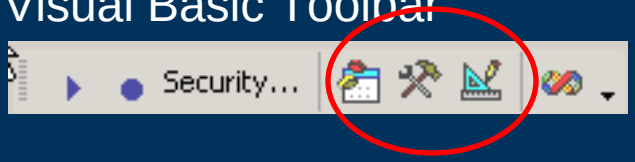
Number (LIBREF): 1214 -> 1215

Tool No: T15 -> T46

Live Demo – 10 minutes!

Techniques

- Search for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify in the table.
  =VLOOKUP(D148;'Proc+Materials'!D$2:E$4;2)
- Visual Basic Toolbar



- TCL (should be replaced by Visual Basic)

- NX Enhancement for handling conical shape of tool + Tool Update Program delivered by Janus Engineering
  http://www.janus-engineering.ch

UGS CONNECTION

AMERICAS 2008

PLM WORLD®
The Voice of Siemens PLM Software Users Worldwide

Siemens PLM Software

SIEMENS

Questions?