Material Test Report
DS0030

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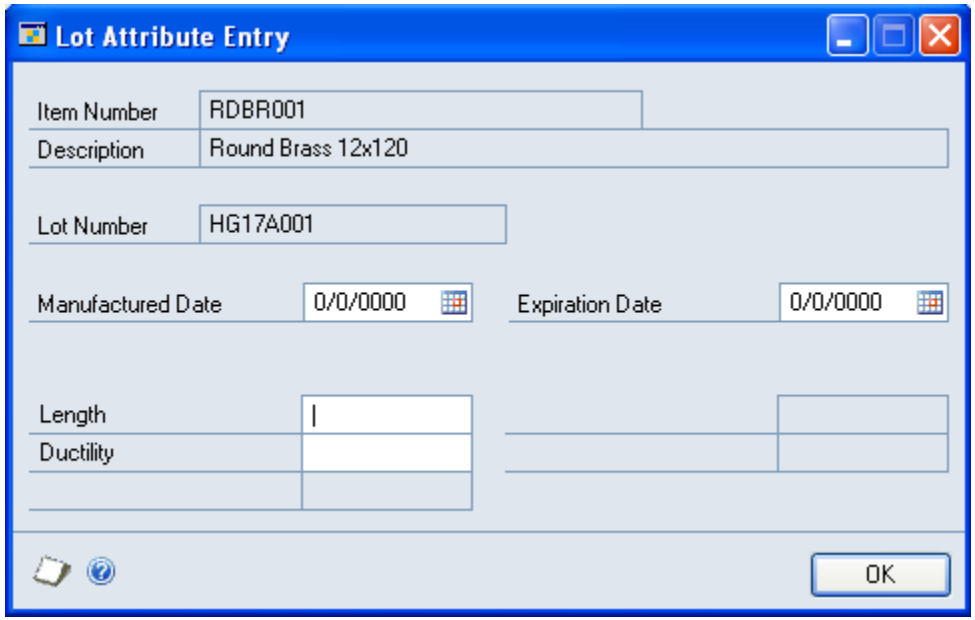
Need Statement

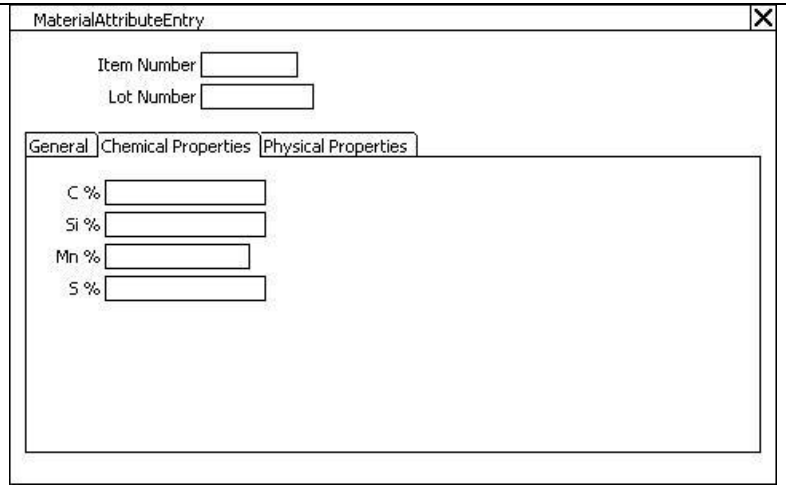
Document	CCDA
ACMEco manufactures equipment for Oil and Gas drilling. The materials used (steel) in the manufacturing process have a large amount of testing data associated with each Lot Number that need to be tracked from purchasing through to distribution. In some cases ACMEco acts only as a broker and never takes possession of the inventory, so they need to be able to record the material information for Lots that do not exist in inventory. Conceptually the Lot Attributes window in Dynamics GP performS the correct function (in terms of tracking information), but needs to be expanded to track many more pieces of data. Additionally, some fields are calculated based on the input in other fields. ACMEco also needs to perform queries in Sales on the data to locate Lots of material that have particular characteristics. ACMEco sometimes needs to record supplementary test information for a specific customer's order (large amount of free notes). Lastly, ACMEco needs to generate a report that shows all of the material information associated with the Lot when the product is sold. There is a specific format for this Material Test Report (Certificate of Analysis).	

Design Features

Overview	CCDA
The proposed design is to create a module that provides the ability to record a large number of attributes attached to each lot number. The fields are drawn from the sample report (see Appedix).  The screen capture above shows the Lot Attribute Entry window for a Lot Category called METAL which is attached to an item called RDBR001. Dynamics GP provides 3 string fields where the user can define the “label” for the field, and 2 date fields. In this case 2 of the 3 string fields have user-defined labels “Length” and “Ductility”. This information follows the lot number throughout the system, from PO receipts, to inventory transfer, to use in	

manufacturing. The window above provides a conceptual model for how Material Attributes will work. The proposed design will create a new window, Material Attribute Entry, that includes all of the required fields (see Standard Attributes table definition below).	

Material Attribute Entry	CCDA
The Material Attribute Entry (MAE) window will be accessible from Cards >> Inventory >> Material Attributes. It will provide a method for adding/editing Material Attributes for any Lot Number in the system. This is a hard-coded approach that will provide a new table with a one column to store each of the additional required fields. The MAE window will also be hard-coded to display the required fields. The approach provides the most direct and cost effective method of storing, retrieving, and reporting on the required data. Since ACMEco's business model is well established, there is not a high rate of change to this information, so the risk of a hard-coded approach is relatively low. The potential downside to this method is that it does not provide an easy way to add a new field in the future. A future change would require additional custom coding to add a new field to the window, and alteration of the database table. Lot attributes are normally editable only during a transaction (such as PO Receiving or an Inventory Adjustment or Transfer). To provide the ability to add/edit attributes at any time, the MAE window will be accessible from Cards >> Inventory >> Material Attributes. Material Attributes can only be maintained on an Lot Number that exists in the Inventory module. In other words, a PO Receipt must be posted so that the lots being received are posted into inventory. At that time the Lot Number will be available to the MAE window. The Material Attribute Entry window will track Standard Attributes and Supplementary Tests. The Standard Attributes have been taken from the sample report (see Appendix), and will be the same for each Lot. Supplementary Tests are extra tests requested by the customer and are linked to a sales transaction. The system will support the ability to record an unlimited number of Supplementary Tests.	



The Supplementary Test Entry window will be available from the Material Attribute Entry window. It will have a lookup to allow linking the Supplementary Test to a sales transaction. For any sales transaction, an unlimited number of Supplementary Tests can be attached. Each test will consist of:

- Test ID: a string field providing a short identifier for the test
- Description: a long string field providing a description of the test
- Result: a long string field to record or describe the result

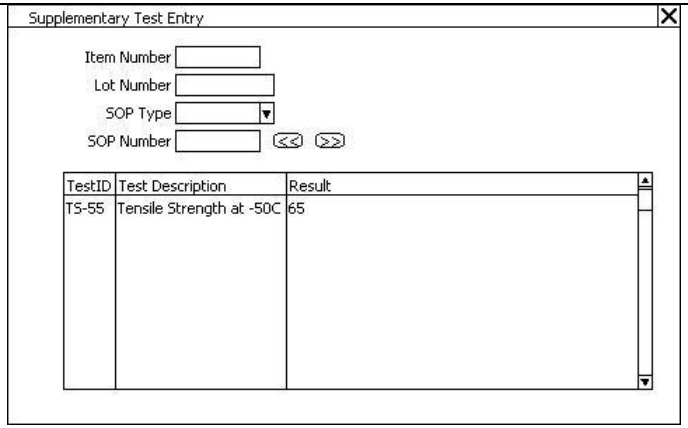


Table Definitions

Stardard Attributes

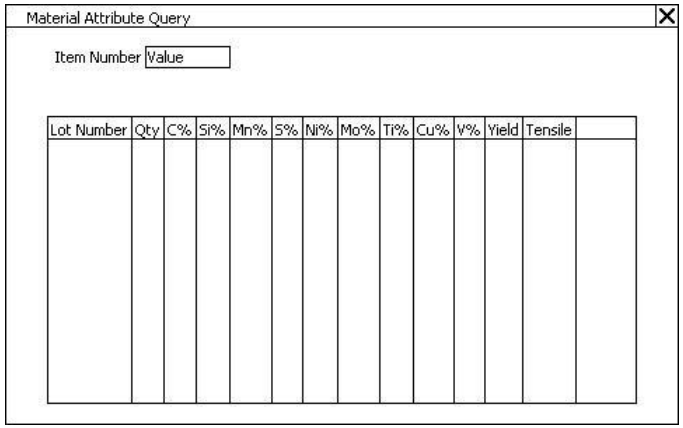
Column Name	Datatype
Item Number	String
Lot Number	String
DimStandard (Dimensions Standard)	String
Material	String
CPct	Numeric
SiPct	Numeric
MnPct	Numeric
SPct	Numeric
PPct	Numeric
CrPct	Numeric
NiPct	Numeric
MoPct	Numeric
TiPct	Numeric
CuPct	Numeric
VPct	Numeric
NbPct	Numeric
NPct	Numeric

AlPct	Numeric
CEPct	Numeric
YP (Yield Point)	Numeric
TS (Tensile Strength)	Numeric
Elong (Elongation)	Numeric
Hard (Hardness)	Numeric
BT (Bend Test)	Numeric
FT (Flattening Test)	Numeric
ImpactType (Impact Test Type)	String
ImpactC (Degrees C)	Numeric
Impact1 (Test 1)	Numeric
Impact2	Numeric
Impact3	Numeric
S –	Numeric
W –	Numeric
X –	Numeric
MatStd (Material Standard)	String
HeatTreat (Heat Treatment)	String
NoteIndex	Integer – links to Dynamics GP Notes so large text notes can be attached to a Lot

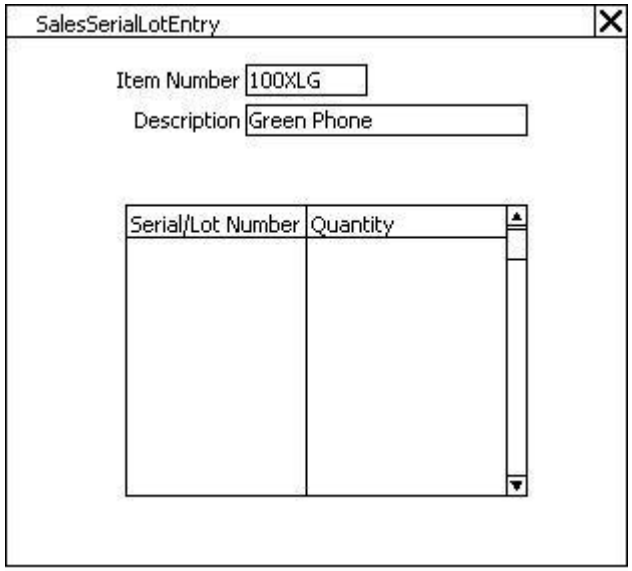
Supplementary Tests

Column Name	Datatype
Item Number	String
Lot Number	String
SOP Type	Integer
SOP Number	String
TestID	String
Description	String
Result	String

Material Attribute Inquiry	CCDA
Material Attribute Inquiry (MAI) is a view-only version of the MAE window. In windows where you can normally view, but not create new, lot numbers, you will have access to the MAI window to view lot number attributes. The Lot Attributes are normally accessible by clicking an expansion button. The MAI window will open instead of Lot Attribute Inquiry. MAI will also be available from Inquiry >> Inventory >> Material Attribute Inquiry. MAI is a copy of the MAE window with all fields locked so they are display only.	

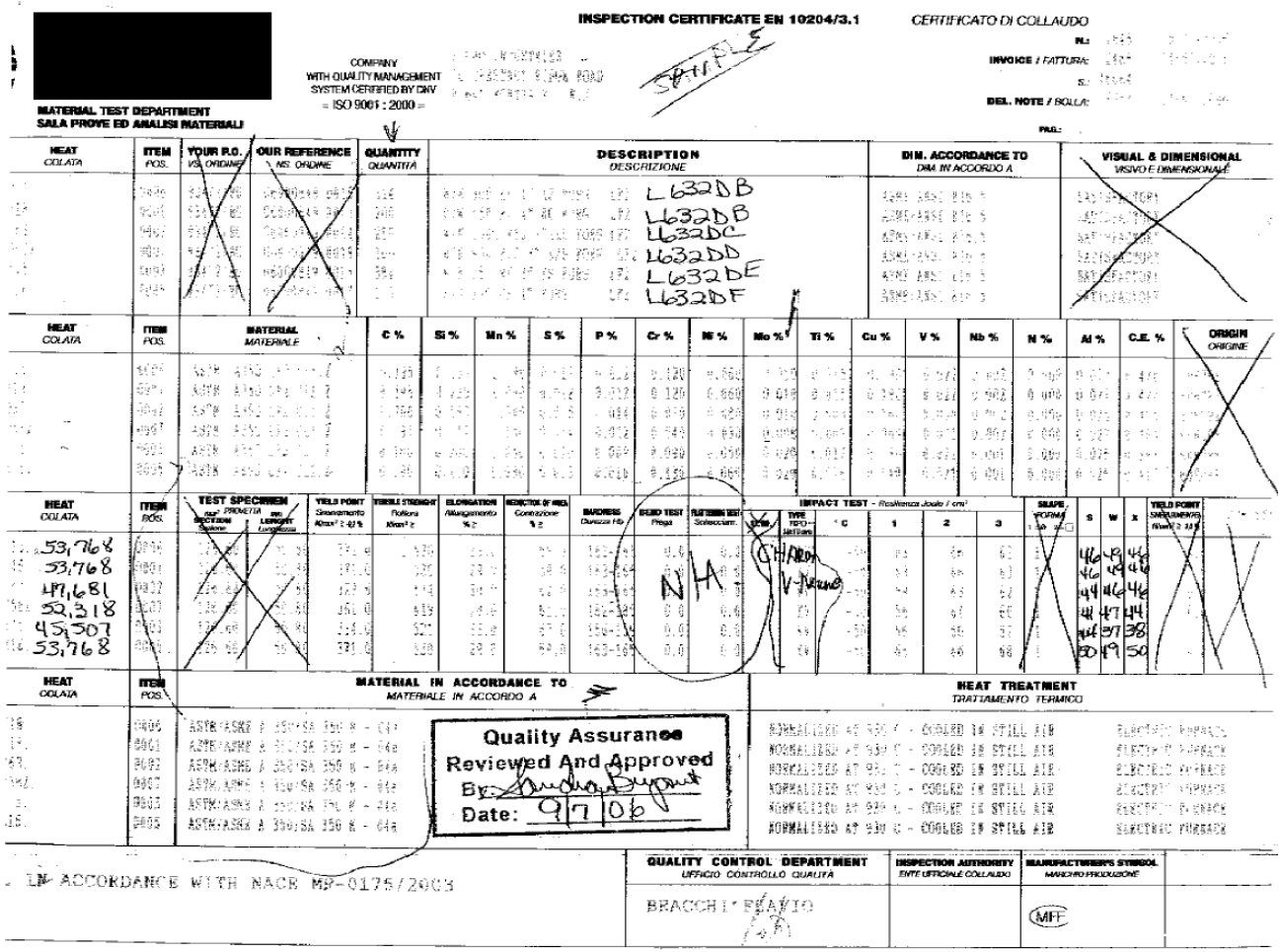
Material Attribute Query	CCDA
The Material Attribute Query (MAQ) window will allow the user to see all attributes for all available lots for a selected item number.  The list view can be sorted by clicking any column. This will allow the user to quickly locate a lot with a given property. Or when sorted by Lot Number, the user can quickly scroll through available lots to compare attributes between lots.	

Material Test Report	CCDA
When a Sales Order is printed, ACMEco needs to have the Material Test Report print for the items on the sales document. See the Appendix for an example of this report. The report will print automatically along with the other Sales documents (such as the sales order or picking ticket), and will also be available from an Extras menu so that it can be reprinted. The report will also be available for historical (posted) documents when viewed in the Sales Transaction Inquiry window. The report will be a Dynamics GP report (vs. Crystal or other external reporting tool). The report will be tied into the Sales Transaction Entry window and pull information, such as Item Numbers, and Serial Numbers from the displayed sales transaction. To build the report the modification will: - find which serial or lot numbered items were selected to fulfill the line. - If the item does not have a Bill of Materials, it is assumed to be a “resale” item that was not manufactured by ACMEco. In this case the software should be able to trace the Lot Number to a Mill Test. - If the item has a Bill of Materials, the following steps will be taken to locate the Mill Test for the raw material: o look in manufacturing to find which manufacturing order produced the serial number o look in manufacturing to find which raw material steel was issued to the manufacturing order (the raw steel in lot tracked) It is assumed that one report format will be sufficient to meet all reporting needs. If alternate report formats are needed for different materials it may significantly affect the estimation.	

Sales Serial/Lot Entry	CCDA
In some cases ACMEco acts as a broker. They need the ability to record lot numbers for material they will not have in inventory, so that they can then record the Mill Test data for that material. A new window, Sales Serial/Lot Entry, will allow recording of Lot Numbers of Serial Numbers for a line item in Sales Transaction Entry, even though the item is not serial or lot tracked. Specifically, Buffalo Flange will use “service” type items when they act as a broker.  This window will be accessed when Sales Transaction Entry is open from an Extras menu.	

Assumptions/Requirements	
1. All material that needs to have associated test data must be set up as Lot Tracked 2. The lot tracked items can have any Lot Category. All of the lot attributes will be tracked in a new table, so no labels need be created on the Lot Category. 3. Manufacturing is being used to create finished goods from lot numbered raw steel inventory. 4. All raw material that has test data is lot numbered 5. During production the Manufacturing Serial-Lot Link window will be used to link materials on every manufacturing order. This link will be critical for the Material Test Report's ability to locate test data for raw materials used in the finished item. NOTE: the lot attributes (test data) do not automatically transfer from a raw material item to the finished good item. We will require that when manufacturing is used, the user will create the linking so that the software can trace back from a finished item to the Mill Test of the raw material used to make the finished item. 6. Report Format: we will create a report similar in format to the sample report. Supplementary Tests will be reported as an attachment sheet with the main report. 7. When ACMEco acts as a broker, there will be Item Number in Dynamics GP with an Item Type of Service. This will allow Sales to use a "real" item, but not need to have On Hand Inventory.	

Appendix



INSPECTION CERTIFICATE EN 10204/3.1

CERTIFICATO DI COLLAUDO

[redacted]

COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001 : 2000 =

MATERIAL TEST DEPARTMENT
SALA PROVE ED ANALISI MATERIALI

INVOICE / FATTURA:

DEL. NOTE / BOLLA:

PAG.:

HEAT COLATA	ITEM POS.	YOUR P.O. VS. ORDINE	OUR REFERENCE N/S. ORDINE	QUANTITY QUANTITÀ	DESCRIPTION DESCRIZIONE	DIM. ACCORDANCE TO DIM. IN ACCORDO A	VISUAL & DIMENSIONAL VISIVO E DIMENSIONALE
					L632DB		
					L632DB		
					L632DC		
					L632DD		
					L632DE		
					L632DF		

HEAT COLATA	ITEM POS.	MATERIAL MATERIALE	C %	Si %	Mn %	S %	P %	Cr %	Ni %	Mo %	Ti %	Cu %	V %	Nb %	N %	Al %	C.E. %	ORIGIN ORIGINE

HEAT COLATA	ITEM POS.	TEST SPECIMEN DIR. PROVETTA SECTION Sezione	TEST SPECIMEN DIR. PROVETTA LENGHT Lunghezza	YIELD POINT Snervamento N/mm² ≥ 40 %	TENSILE STRENGHT Rottura N/mm² ≥	ELONGATION Allungamento % ≥	RESISTOR OF AREA Contrazione % ≥	BAUDRIS Durezza Hb	BEND TEST Piega	FLATTENING TEST Schiacciam.	IMPACT TEST - Resilienza Joule / cm² NOTCH TYPE	°C	1	2	3	SHAPE FORMA	S	W	X	YIELD POINT SNERVAMENTO N/mm² ≥ 355
53,768																				
53,768																				
47,681																				
52,318																				
45,507																				
53,768																				

HEAT COLATA	ITEM POS.	MATERIAL IN ACCORDANCE TO MATERIALE IN ACCORDO A	HEAT TREATMENT TRATTAMENTO TERMICO

Quality Assurance
Reviewed And Approved
By: Andrea Bugnoli
Date: 9/7/06

IN ACCORDANCE WITH NACE MR-0175/2003

QUALITY CONTROL DEPARTMENT UFFICIO CONTROLLO QUALITÀ	INSPECTION AUTHORITY ENTE UFFICIALE COLLAUDO	MANUFACTURER'S STAMP MARCHIO PRODUZIONE
BRACCHI FLAVIO		MF

[redacted]

SAMPLE

ORDER NUMBER	0077191
PO NUMBER	150-47-24753
ORDER DATE	12/13/05

MATERIAL TEST REPORT

SOLD	SHIP
	123-311

ITEMS

Ln#	Qty	Description	Matl Spec	Heat Code	Mill Heat Number
001	50	2" 150 RF THD 647AA	SA105-03	B6W	16655
002	12	2-1/2" 300 RF BLIND 647AF	SA105-03	D475	SM249211
003	16	2-1/2" 300 RF SO 647ACx	SA105-03	D314	SM233333

CHEMICAL PROPERTIES

Heat Code	C	Si	Mn	P	S	Cr	Al	Cu	Ni	Mo	V	Cb				CE
B6W	0.180	0.200	1.150	0.010	0.008	0.070	0.036	0.170	0.090	0.010	0.001	0.002	0.000	0.000	0.000	0.405
D475	0.190	0.210	0.840	0.010	0.018	0.060	0.000	0.250	0.080	0.018	0.001	0.001	0.000	0.000	0.000	0.368
D314	0.200	0.220	0.850	0.012	0.016	0.190	0.000	0.260	0.100	0.049	0.002	0.002	0.000	0.000	0.000	0.414

PHYSICAL PROPERTIES

Heat Code	Tensl	Yield	%Elong	%R.A.	BHN	Charpy	Ft-Lbs	Lat Expan	Shr Fract	Test Temp
B6W	72935	51910	27.80	53.76	153					
D475	73864	44223	38.00	62.90	156					
D314	80039	47430	32.00	37.00	149					

NOTES

Heat Code	Note
B6W	
D475	
D314	

We certify our flanges are capable of passing a hydrostatic test compatible with their rating and all test results and process information contained herein are correct and true as contained in company records. All Flanges meet NACE MR0-175 and/or MR0-103 Latest Revision. Our Quality system has been registered by ABS to ISO 9001, certification no.: 30696
Test results complies with: EN 10204-3.1.
Our flanges sabisfy the material requirements for PED 97/23/EC annex 1-4.3.

Not withstanding the absence of a signature, the organization submitting either a printed certificate or an EDI transmitted certificate is responsible for content of the report. (ASTM A961/A 961-04a Section 19.4)

Quality Assurance
Reviewed And Approved
By: Sandra Boyd
Date: 1/9/06

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