

KETIV

Manufacturing Innovation. Together.

```
' This rule is used to place the shell plates in the tank body assembly
' It uses constraints to place each shell, and staggers them so that the seam
'   alternates from one side of the tank to the other
Dim intTotalShells As Integer

' This variable calculates how many total shells is needed for this assembly
' This is based on the length of the tank, combined with information in the Excel spreadsheet
intTotalShells = SHELL_Q_1 + SHELL_Q_2

' The template had two pre-built constraints that would fail after running through the automation
' I found that I could fix them by just creating them at run time, rather than having them
'   pre-baked into the template
' This happens sometimes, and you need to be creative to work around certain issues
Constraints.AddMate("Mate:1", "ASME Dished Head:1", "Work Plane2", "",
    "XY Plane", TANK_L / 2 ul)
Constraints.AddMate("Flush:2", "ASME Dished Head:2", "Work Plane2",
    "ASME Dished Head:1", "Work Plane2", TANK_L)

' First create the shell files in your local directory
Dim strOldFilename As String
Dim strNewFilename1, strNewFilename2 As String

strOldFilename = TEMPLATE_PATH & "\Tank Body Assy\Shell.ipt"

' These lines of code create copies of the shell plates, and give them filenames that include the shell width
If SHELL_Q_1 >= 1 Then
    strNewFilename1 = PROJECT_PATH & PROJECT_ID & "\Tank Body Assy\Shell - " & SHELL_W_1 & " Wide - " & PROJECT_ID & ".ipt"
    System.IO.File.Copy(strOldFilename, strNewFilename1)
End If

' Some tank lengths don't need two different widths in order to get the length to come out properly
' In that case, we don't want to create another shell plate model if we don't need it
If SHELL_Q_2 >= 1 Then
    strNewFilename2 = PROJECT_PATH & PROJECT_ID & "\Tank Body Assy\Shell - " & SHELL_W_2 & " Wide - " & PROJECT_ID & ".ipt"
    System.IO.File.Copy(strOldFilename, strNewFilename2)
End If

Dim strNewFilename As String
Dim intShellWidth As Integer
Dim intRunningLength As Integer

' This variable will track our progress as we move down the tank and place the individual shell plates
intRunningLength = 0

' This For loop is the meat of placing the shell plates into our assembly
For j = 1 To intTotalShells
    ' If j is less than the total number of shell plates with thickness 1, then we need to insert more shell
    '   plates with thickness 1
    ' Otherwise, we need to insert new shell plates with thickness 2 (represented by the "SHELL_W_2" parameter
    If j <= SHELL_Q_1 Then
        strNewFilename = strNewFilename1
        intShellWidth = SHELL_W_1
    Else
        strNewFilename = strNewFilename2
        intShellWidth = SHELL_W_2
    End If
End If
```



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' Add the part to the assembly
Dim strBrowserName As String

' We are now ready to add the shell plates into our tank body assembly
' Note that we first define how we want the occurrence name of each shell plate to be listed in the model browser
' Then we place them into the assembly (at the origin)
strBrowserName = "Shell " & intShellWidth & " Wide:" & j

Dim oShell = Components.Add(strBrowserName, strNewFilename)

' The Mod operator returns the remainder of a division calculation
' In this case, if j is 1, 1 divided by 2 has a remainder of 1 (the answer is 0, with a remainder of 1)
' If j is 2, then 2 divided by 2 is 1, and there is no remainder
' This trick lets us alternate what constraints we use as we place each shell plate
If j Mod 2 = 1 Then
    ' Notice that we use our "intRunningLength" variable to create an offset value for each new plate that gets placed
    ' Then at the end of the routine, we increase the value of "intRunningLength" by the current shell width,
    ' so that when we place the next shell, we have the next offset value ready to go
    Constraints.AddFlush("Flush:" & 8 + (j - 1) * 3 + 1, "", "YZ Plane", strBrowserName, "YZ Plane")
    Constraints.AddFlush("Flush:" & 8 + (j - 1) * 3 + 2, "", "XZ Plane", strBrowserName, "XZ Plane")
    Constraints.AddFlush("Flush:" & 8 + (j - 1) * 3 + 3, strBrowserName, "XY Plane", "",
        "Work Plane1", intRunningLength + intShellWidth / 2 in)
Else
    Constraints.AddMate("Mate:" & 8 + (j - 1) * 3 + 1, "", "YZ Plane", strBrowserName, "YZ Plane")
    Constraints.AddFlush("Flush:" & 8 + (j - 1) * 3 + 2, "", "XZ Plane", strBrowserName, "XZ Plane")
    Constraints.AddMate("Mate:" & 8 + (j - 1) * 3 + 3, "", "Work Plane1", strBrowserName,
        "XY Plane", (intRunningLength + intShellWidth / 2) * -1 in)

End If

' We don't need to push parameters for each instance if the parts are the same model
' This finds the first instance of shell width 1, and the first instance of shell width 2, and then passes
' the "TANK_OD" and "SHELL_W" parameters
If j = 1 Or j = SHELL_Q_1 + 1 Then
    Parameter(strBrowserName, "TANK_OD") = TANK_OD
    Parameter(strBrowserName, "SHELL_W") = intShellWidth
End If
intRunningLength = intRunningLength + intShellWidth

Next

' This next bit of code uses the Inventor API to suppress the assembly cuts for the manway and gunline if they are not used
' in the assemblies
Dim oShellAssy As AssemblyDocument
oShellAssy = ThisApplication.Documents.ItemByName(PROJECT_PATH & PROJECT_ID & "\\Tank Body Assy\\Tank Body Assy - " & PROJECT_ID & ".iam")
Dim oAssyDef As AssemblyComponentDefinition = oShellAssy.ComponentDefinition

If MANWAY = False Then oAssyDef.Features(1).Suppressed = True
If GUNLINE = False Then oAssyDef.Features(
```