

รายการอ้างอิง

ภาษาไทย

- กรมควบคุมมลพิษ. 2543. สถานการณ์และการจัดการปัญหามลพิษทางอากาศและเสียง ปี 2541.
กรุงเทพฯ : กรมควบคุมมลพิษ กระทรวงวิทยาศาสตร์ เทคโนโลยีและสิ่งแวดล้อม
- นภาพร พานิช. 2544. ปัญหาฝุ่นละอองในกทม. วารสารสิ่งแวดล้อม 5 (เมษายน-มิถุนายน): 10-23.
- นภาพร พานิช และ แสงสันดี พานิช. 2544. แบบจำลองทางคณิตศาสตร์ด้านคุณภาพอากาศ. พิมพ์ครั้งที่ 1. กรุงเทพฯ : บริษัทนาเพรส แอนด์ กราฟฟิค จำกัด
- ปราณี บุญเปล่ง, วรานนท์ ทวีวัฒนวงศ์และสุทธิกานต์ ประสานดี. 2544. การศึกษาผลกระทบของ ฝุ่นละอองขนาดเล็กต่อการเกิดอาการโรคระบบทางเดินหายใจของประชาชนที่อาศัยอยู่ ใกล้โรงไหมหิน สุรินทร์. วารสารสสม.อีสาน 16 (มิถุนายน-กรกฎาคม): 28-35.
- มาลินี ศรีสุวรรณ. 2543. การศึกษาความสัมพันธ์ของทิศทางการไหลของอากาศกับการเจาะช่องเปิดที่ผนัง อาคารสำหรับภูมิอากาศร้อนชื้นในประเทศไทย. กรุงเทพฯ: คณะสถาปัตยกรรมศาสตร์ มหาวิทยาลัยศิลปากร

ภาษาอังกฤษ

- Abt, E. Suh, H. H., Catalano, P., and Koutrakis, P. 2000. Relative contribution of outdoor and indoor particle sources to indoor concentrations. Environmental Science & Technology. 34: 3579-3587.
- Alzona, J., Cohen, B. L., Rudolph, H., Jow, H. N., and Frohlinger, J. O. 1979. Indoor-outdoor relationships for airborne particulate matter of outdoor origin. Atmospheric Environment. 13 : 55-60.
- Chan, A., T. 2002. Indoor-outdoor relationships of particulate matter and nitrogen oxides under different outdoor meteorological conditions. Atmospheric Environment. 36: 1543-1551.
- Chao, C. Y. H., Wan M. P., and Cheng, E. C. K. 2003. Penetration coefficient and deposition rate as a function of particle size in non-smoking naturally ventilated residences. Atmospheric Environment. 37: 4233-4241.
- Chao, C. Y. H., and Wong, K. K. 2002. Residential indoor PM₁₀ and PM_{2.5} in Hong Kong and the elemental composition. Atmospheric Environment. 36, 265-277.
- Chang, J. C. and Hanna S. R. 2004. Air quality model performance evaluation. Meteorology and Atmospheric physics. 87: 167-196.

- Chen, Y. C., Yuanhui, Z., and Barber, E. M. 2000. A dynamic method to estimate indoor dust sink and source. Building and Environment. 35: 215-221.
- Fisher, P. H., et al. 2000. Traffic-related differences in outdoor and indoor concentrations of particles and volatile organic compounds in Amsterdam. Atmospheric Environment. 34: 3713-3722.
- Funasaka, K., Miyazaki, T., Tsuruho, K., Tamur, K., Mizuno, T., and Kuroda, K. 2000. Relationship between indoor and outdoor carbonaceous particulates in roadside households. Environmental Pollution. 110: 127-134.
- Godish, T. 2001. Indoor Environmental Quality. Florida: Lewis Publishers.
- Godish, T. 2003. Air quality. 4th ed. Florida: Lewis Publishers.
- Goyal, P., Chan, A. T., and Jaiswal, N. 2006. Statistical models for the prediction of respirable suspended particulate matter in urban cities. Atmospheric Environment. 40: 2068-2077.
- Haward-Reed, C., Wallace, L. A., and Emmerich, S. J. 2003. Effect of ventilation systems and air filters on decay rates of particles produced by indoor sources in an occupied townhouse. Atmospheric Environment. 37: 5295-5306.
- Jones, N. C., Thornton, C. A., Mark, D., and Harrison, R. M. 2000. Indoor/outdoor relationships of particulate matter in domestic homes with roadside, urban and rural locations. Atmospheric Environment. 34: 2603 – 2612.
- Katsoulas, N., Bartzanas, T., Boulard, T., Mermier, M., and Kittas, K. 2006. Effect of vent opening and insect screen on greenhouse ventilation. Biosystems Engineering[online]. Available from: <http://www.sciencedirect.com>[2006, April 3]
- Kingham, S., Brigg, D., Elliott, P., Fischer, P., and Erik, L. 2000. Spatial variations in the concentrations of traffic-related pollutants in indoor and outdoor air in Huddersfield, England. Atmospheric Environment. 34: 905-916.
- Koistinen, K. J., et al. 2001. Behavioral and environmental determinants of personal exposures to PM_{2.5} in EXPOLIS-Helsinki, Finland. Atmospheric Environment. 35: 2473-2481.
- Lee, H. S., Kang, B. W., Cheong, J. P., and Lee, S. K. 1997. Relationships between indoor and outdoor air quality during the summer season in Korea. Atmospheric Environment. 31: 1689-1693.
- Lee, S. C., and Chang, M. 2000. Indoor and outdoor air quality investigation at schools in Hong Kong. Chemosphere. 41: 109-113.

- Li, Y., and Chen, Z. 2003. A balance-point method for assessing the effect of natural ventilation on indoor particle concentrations. Atmospheric Environment. 37: 4277-4285.
- Long, C. M., Suh, H. H., Catalano, P. J., and Koutrakis, P. 2001. Using time- and size-resolved particulate data to quantify indoor penetration and deposition behavior. Environmental Science and Technology. 35: 2089-2099.
- Meyer, B. 1983. Indoor air quality. Massachusetts: Addison-Wesley Publishing Company, Inc.
- Monn, C., et al. 1997. Particulate matter less than 10 μm (PM_{10}) and fine particles less than 2.5 μm ($\text{PM}_{2.5}$): Relationships between indoor, outdoor, and personal concentrations. Science of the Total Environment. 208: 15-21.
- Nevers, N. D. 1995. Air pollution control engineering. USA: McGraw-Hill Inc.
- Pellizzari, E. D., et al. 1999. Particulate matter and manganese exposures in Toronto, Canada. Atmospheric Environment. 33: 721-734.
- Roorda-Knape, M. C., et al. 1998. Air pollution from traffic in city districts near major motorways. Atmospheric Environment. 32: 1921-1930.
- Schneider, A., et al. 2004. Prediction of indoor concentration of 0.5 – 4 μm particles of outdoor origin in an uninhabited apartment. Atmospheric Environment. 38: 6349-6359.
- Schnelle, K. B., Jr., and Dey, P. R. 2000. Atmospheric dispersion modeling compliance guide. New York: McGraw-Hill.
- Spengler, J. D., Dockery, D. W., Turner, W. A., Wolfson, J. M., and Ferris, B. G., Jr. 1981. Long-term measurements of respirable sulfates and particles inside and outside homes. Atmospheric Environment. 15: 23-30.
- Thatcher, T. L., Lai, A. C., Jackson, R. M., Sextro, R. G., and Nazaroff, W. W. 2002. Effects of room furnishings and air speed on particle deposition rates indoors. Atmospheric Environment. 36: 1811-1819.
- Thatcher, T. L., and Layton, D. W. 1995. Deposition, resuspension, and penetration of particles within a residence. Atmospheric Environment. 29: 1487-1497.
- Turiel, I. 1985. Indoor air quality and human health. Stanford : Stanford University Press.
- Wagner, T. P. 1994. In our backyard : A guide to understanding pollution and its effects. New York : Van Nostrand Reinhold.

- Williams, R., Suggs, J., Rea, A., Sheldon, L., Rodes, C., and Thornburg, J. 2003. The research triangle park particulate matter panel study: modeling ambient source contribution to personal and residential PM mass concentrations. Atmospheric Environment 37: 5356 – 5378.
- Zhao, B., Zhang, Y., Li, X., Yang, X., and Huang, D. 2004. Comparison of indoor aerosol particle concentration and deposition in different ventilated rooms by numerical method. Building and Environment. 39: 1-8.
- Zhu, Y., et al. 2005. Penetration of freeway ultrafine particle into indoor environment. Aerosol Science. 36: 303-322.

ภาคผนวก

ภาคผนวก ก

ข้อมูลสรุปฝุ่นละอองภายในอาคาร ภายนอกอาคารและสัดส่วนฝุ่นละอองภายในต่อภายนอกอาคาร
และข้อมูลความเร็วลมและทิศทางลม รายวันที่ทำการเก็บตัวอย่าง

ตาราง ก-1 ข้อมูลความเข้มข้นฝุ่นละอองเฉลี่ยรายวันที่ทำการศึกษา เมื่อวันที่ 14 ตุลาคม 2547
ถึง 2 ธันวาคม 2547

Date	indoor concentration ($\mu\text{g m}^{-3}$)			outdoor concentration ($\mu\text{g m}^{-3}$)			Indoor-outdoor ratio (I/O)		
	TSP	PM10	PM2.5	TSP	PM10	PM2.5	TSP	PM10	PM2.5
10/14/04	61.37	37.87	8.68	17.36	15.33	6.95	3.62	2.49	1.26
10/15/04	82.50	51.14	11.74	25.34	22.18	9.35	3.36	2.34	1.26
10/19/04	94.98	56.83	13.30	27.93	24.50	11.37	3.43	2.31	1.17
10/20/03	110.90	60.67	12.34	31.78	26.53	10.02	3.57	2.31	1.23
10/21/04	117.38	64.87	17.11	33.17	29.04	14.63	3.39	2.16	1.17
10/27/04	85.61	52.55	14.66	32.82	28.46	13.01	2.65	1.86	1.13
10/28/04	108.40	64.24	16.71	35.66	31.00	14.52	3.04	2.06	1.15
10/29/04	49.53	31.79	8.04	20.52	17.50	7.07	2.48	1.84	1.15
11/02/04	57.64	34.80	7.45	19.01	15.78	6.04	3.20	2.25	1.23
11/03/04	61.55	37.12	6.69	16.20	13.28	4.99	3.91	2.80	1.34
11/05/04	70.02	44.30	8.52	21.19	17.84	6.47	3.70	2.66	1.38
11/08/04	53.95	33.52	6.91	17.16	14.23	5.53	3.40	2.45	1.27
11/09/04	60.21	37.92	7.51	19.33	15.80	5.67	3.25	2.41	1.33
11/11/04	70.02	43.99	7.74	21.43	17.52	5.73	3.43	2.53	1.35
11/12/04	68.23	41.79	7.10	19.98	16.16	5.20	3.57	2.61	1.37
11/19/04	67.89	38.65	5.63	16.50	13.71	4.06	4.36	2.90	1.42
11/30/04	93.05	48.40	7.16	20.75	17.24	5.49	4.78	2.90	1.31
12/01/04	62.87	38.23	8.07	20.85	17.57	6.66	3.10	2.20	1.21
12/02/04	63.66	40.98	8.84	24.68	20.77	7.20	2.67	2.01	1.24

ตาราง ก-2 ข้อมูลความเร็วลมและทิศทางลมเฉลี่ยรายวันที่ทำการศึกษา เมื่อวันที่ 14 ตุลาคม 2547 ถึง 2 ธันวาคม 2547

วันที่	ความเร็วลมเฉลี่ย (m s^{-1})	ทิศทางลมเฉลี่ย (องศา)
14 ตุลาคม 2547	1.32 ± 1.13	78.53 ± 33.14
15 ตุลาคม 2547	1.77 ± 0.97	56.88 ± 21.84
19 ตุลาคม 2547	2.51 ± 1.26	73.72 ± 22.93
20 ตุลาคม 2547	2.48 ± 1.02	78.85 ± 17.74
21 ตุลาคม 2547	2.60 ± 1.08	72.67 ± 20.57
27 ตุลาคม 2547	2.01 ± 1.05	65.80 ± 27.71
28 ตุลาคม 2547	3.13 ± 0.94	61.24 ± 23.66
29 ตุลาคม 2547	3.18 ± 0.86	72.02 ± 19.39
2 พฤศจิกายน 2547	3.21 ± 1.00	71.30 ± 34.86
3 พฤศจิกายน 2547	2.41 ± 1.04	80.93 ± 97.60
5 พฤศจิกายน 2547	1.54 ± 1.05	78.39 ± 59.45
8 พฤศจิกายน 2547	1.92 ± 1.14	75.95 ± 24.55
9 พฤศจิกายน 2547	1.86 ± 1.57	77.96 ± 45.02
11 พฤศจิกายน 2547	1.19 ± 1.24	88.06 ± 41.42
12 พฤศจิกายน 2547	1.32 ± 1.13	78.53 ± 33.14
19 พฤศจิกายน 2547	2.29 ± 1.02	77.76 ± 33.53
30 พฤศจิกายน 2547	1.01 ± 1.12	86.67 ± 78.14
1 ธันวาคม 2547	1.72 ± 1.11	73.77 ± 72.27
2 ธันวาคม 2547	1.10 ± 1.01	64.48 ± 60.09

ตาราง ก-3 ข้อมูลความเข้มข้นฝุ่นละอองเฉลี่ยรายวันที่ทำการศึกษา เมื่อวันที่ 9 มีนาคม 2549 ถึง 12 มีนาคม 2549

Date	indoor concentration ($\mu\text{g m}^{-3}$)			outdoor concentration ($\mu\text{g m}^{-3}$)		
	TSP	PM ₁₀	PM _{2.5}	TSP	PM ₁₀	PM _{2.5}
9 มีนาคม 2549	136.001	72.082	46.600	26.567	20.745	7.995
10 มีนาคม 2549	115.421	62.394	42.311	25.627	17.914	7.251
11 มีนาคม 2549	80.052	39.687	20.603	20.453	13.538	5.691
12 มีนาคม 2549	81.717	48.551	33.837	20.662	16.163	6.284

ตาราง ก-4 ข้อมูลความเร็วลมและทิศทางลมเฉลี่ยรายวันที่ทำการศึกษา เมื่อวันที่ 9 มีนาคม 2549 ถึง 12 มีนาคม 2549

วันที่	ความเร็วลมเฉลี่ย (m s^{-1})	ทิศทางลมเฉลี่ย (องศา)
9 มีนาคม 2549	2.45 ± 1.65	140.44 ± 319.29
10 มีนาคม 2549	2.89 ± 1.56	136.59 ± 13.94
11 มีนาคม 2549	4.00 ± 1.59	145.22 ± 13.08
12 มีนาคม 2549	2.08 ± 1.47	125.73 ± 32.51

ภาคผนวก ข

ชุดคำสั่งของโปรแกรมทำนายความเข้มข้นฝุ่นละอองภายในอาคาร

Option Explicit

Dim sngPredictResult As Single

Dim strLatestReport As String

Public Sub ChkCmdSubmit()

```

    If Me.lblVtxtC_Out.Visible = False And _
       Me.lblVtxtWindow_Number.Visible = False And _
       Me.lblVtxtVolume_of_House.Visible = False And _
       Me.lblVtxtWind_Speed.Visible = False And _
       Me.lblVtxtLoop.Visible = False _
    Then
        Me.cmdPredict.Enabled = True
    Else
        Me.cmdPredict.Enabled = False
    End If

```

End Sub

Private Sub cboWind_Direct_level_GotFocus()

AutDrpFocus Me.cboWind_Direct_level

End Sub

Private Sub cboWindow_Direction_GotFocus()

AutDrpFocus Me.cboWindow_Direction

End Sub

Private Sub cmdAbout_Click()

frmAboutProgram.Show vbModal

End Sub

Private Sub cmdClear_Click()

SetAllTextToBlank

Me.optScreen.Value = True

```

Me.lblVtxtC_Out.Visible = True
Me.lblVtxtVolume_of_House.Visible = True
Me.lblVtxtWindow_Number.Visible = True
Me.lblVtxtWind_Speed.Visible = True
Me.lblVtxtLoop.Visible = True

```

SetEnableAirExFrame

Me.txtC_Out.SetFocus

sngPredictResult = 0

strLatestReport = ""

End Sub

Private Sub SetAllTextToBlank()

Dim ctrlControl As Control

```

For Each ctrlControl In Me
  If TypeOf ctrlControl Is TextBox Then
    ctrlControl.Text = ""
  ElseIf TypeOf ctrlControl Is ComboBox Then
    ctrlControl.ListIndex = 0
  End If

Next

End Sub
Private Sub cmdExit_Click()

  Unload Me

End Sub
Private Function CalWithScreen() As Single

  Dim sngWindSpeed As Single
  Dim intWindDirectLevel As Integer
  Dim intWindowNumber As Integer
  Dim intWindowDirection As Integer
  Dim sngResult As Single

  sngWindSpeed = 3.979 * Val(Trim(Me.txtWind_Speed.Text))
  intWindDirectLevel = 12.627 * Val(Trim(Me.cboWind_Direct_level.Text))
  intWindowNumber = 2.546 * Val(Trim(Me.txtWindow_Number.Text))
  intWindowDirection = (-1.033) * Val(Trim(Me.cboWindow_Direction.Text))

  sngResult = sngWindSpeed + intWindDirectLevel + intWindowNumber +
intWindowDirection
  sngResult = sngResult - 23.508

  CalWithScreen = Str(sngResult)

End Function
Private Function CalWithoutScreen() As Single

  Dim sngWindSpeed As Single
  Dim intWindDirectLevel As Integer
  Dim intWindowNumber As Integer
  Dim intWindowDirection As Integer
  Dim sngResult As Single

  sngWindSpeed = 2.318 * Val(Trim(Me.txtWind_Speed.Text))
  intWindDirectLevel = 5.124 * Val(Trim(Me.cboWind_Direct_level.Text))
  intWindowNumber = (-0.187) * Val(Trim(Me.txtWindow_Number.Text))
  intWindowDirection = 8.469 * Val(Trim(Me.cboWindow_Direction.Text))

  sngResult = sngWindSpeed + intWindDirectLevel + intWindowNumber +
intWindowDirection
  sngResult = sngResult - 10.741

  CalWithoutScreen = Str(sngResult)

End Function

```

```

Private Sub cmdPredict_Click()

    Dim sngC_Out As Single
    Dim sngC_Zero As Single
    Dim sngK As Single

    Dim sngRoomVolume As Single
    Dim intLoop As Integer

    Dim sngAirExcRate As Single

    'Activity variable
    Dim sngDust_Cooking As Single
    Dim intTime_Cooking As Integer

    Dim sngDust_Smoking As Single
    Dim intTime_Smoking As Integer
    Dim intAmount_Smoking As Integer

    Dim sngDust_Other As Single
    Dim intTime_Other As Integer

    '=====
    'Create Text File

    Dim fsLog As FileSystemObject
    Dim tsLog As TextStream
    Dim strLogFileFileName As String

    '=====
    Dim i As Integer

    On Error GoTo ShowError

    'Require field1
    sngC_Out = Val(Trim$(Me.txtC_Out.Text))

    If Trim$(Me.txtC_Zero.Text) <> "" Then
        sngC_Zero = Val(Trim$(Me.txtC_Zero.Text))
    Else
        sngC_Zero = sngC_Out * sngIORatio
    End If

    If Trim$(Me.txtDecayRate.Text) <> "" Then
        sngK = Val(Trim$(Me.txtDecayRate.Text))
    Else
        sngK = sngDecayRateDefault
    End If

    sngK = sngK / 60

    'Require field2
    sngRoomVolume = Val(Trim$(Me.txtVolume_of_House.Text))

    'Require field3
    intLoop = Val(Trim$(Me.txtLoop.Text))

    If Trim$(Me.txtAirExchangeRate.Text) <> "" Then
        sngAirExcRate = Val(Trim$(Me.txtAirExchangeRate.Text))
    End If

```

```

Else
    sngAirExcRate = CalAirExcRate
    Me.txtAirExchangeRate.Text = CStr(Round(sngAirExcRate, 4))
End If

strLogFileName = App.Path & strReportPath & "\ " & FormatDateLog(Now) & ".txt"
strLatestReport = strLogFileName

Set fsLog = CreateObject("scripting.filesystemobject")
Set tsLog = fsLog.CreateTextFile(strLogFileName, True)

For i = 1 To intLoop

    If i > 1 Then
        sngC_Zero = sngPredictResult
    End If

    sngPredictResult = (sngC_Out * sngAirExcRate / 60) + (sngC_Zero) - (sngK *
sngC_Zero) - (sngC_Zero * sngAirExcRate / 60)

    If i = 1 Then
        Me.txtCin.Text = CStr(Round(sngPredictResult, 4))

    Else

    End If

    tsLog.WriteLine "M" & Str(i) & ": Result = " & CStr(Round(sngPredictResult, 4))

Next

tsLog.Close

'Me.txtCin.Text = CStr(Round(sngPredictResult, 4))

Me.cmdReport.Enabled = True

Exit Sub

ShowError:

    MsgBox "Error No. " & Err.Number & " - " & Err.Description, vbExclamation, strPrjName

End Sub
Private Function CalAirExcRate() As Single

    Dim intWinNumber As Integer
    Dim sngWindSpeed As Single
    Dim intWinDirect As Integer
    Dim intWindDirectLev As Integer
    Dim intScreen As Integer

    On Error GoTo ShowError

    'Require field4
    intWinNumber = Val(Trim$(Me.txtWindow_Number.Text))

    'Require field5

```

```

sngWindSpeed = Val(Trim$(Me.txtWind_Speed.Text))

intWinDirect = Me.cboWindow_Direction.ListIndex + 1

intWindDirectLev = Me.cboWind_Direct_level.ListIndex + 1

If Me.optScreen.Value = True Then
    intScreen = 1
Elseif Me.optWithout_screen.Value = True Then
    intScreen = 2
End If

CalAirExcRate = (sngConstWinNum * intWinNumber) + _
                (sngConstWindSpeed * sngWindSpeed) + _
                (sngConstWindDirecLev * intWindDirectLev) + _
                (sngConstWindowDirect * intWinDirect) + _
                (sngConstScreen * intScreen) + _
                sngConstAirExcRate

Exit Function

ShowError:

    MsgBox "Error No. " & Err.Number & " - " & Err.Description, vbExclamation, strPrjName
    CalAirExcRate = 0

End Function
Private Sub CreateLogFile()

    Dim fsLog As FileSystemObject
    Dim tsLog As TextStream
    Dim strLogFileName As String

    On Error GoTo ShowError

    strLogFileName = App.Path & strReportPath & "\" & FormatDateLog(Now) & ".txt"
    strLatestReport = strLogFileName

    Set fsLog = CreateObject("scripting.filesystemobject")
    Set tsLog = fsLog.CreateTextFile(strLogFileName, True)

    With tsLog

        .WriteLine ("abc")
        .WriteLine ("def")
        .Close

    End With

    Exit Sub

ShowError:

    MsgBox "Error No. " & Err.Number & " - " & Err.Description, vbExclamation, strPrjName

End Sub

Private Sub cmdReport_Click()

```

```

Dim dblOpenLog As Double
dblOpenLog = Shell(strNotePadPath & " " & strLatestReport, vbMaximizedFocus)

End Sub

Private Sub Form_KeyDown(KeyCode As Integer, Shift As Integer)
    ChkKeyDown KeyCode, Me.ActiveControl
End Sub

Private Sub Form_KeyPress(KeyAscii As Integer)
    ChkKeyPress KeyAscii, Me
End Sub

Private Sub Form_Load()

    Me.lblTopic.Width = Me.Width
    Me.sstActivity.Tab = 0
    'Me.cmdPredict.Enabled = False

    '-----

    'me.cboWindow_direction
    Me.cboWindow_Direction.AddItem "เปิดหน้าต่างด้านเดียวกันของผนังห้อง"
        'value=1
    Me.cboWindow_Direction.AddItem "เปิดหน้าต่างที่ผนังอยู่ตั้งฉากกัน"
        'value=2
    Me.cboWindow_Direction.AddItem "เปิดหน้าต่างด้านที่อยู่ตรงข้ามกัน"
        'value=3
    Me.cboWindow_Direction.AddItem "เปิดหน้าต่างทั้งสามด้านของผนังห้อง"
        'value=4

    Me.cboWindow_Direction.ListIndex = 0

    'me.cboWind_direct_level
    Me.cboWind_Direct_level.AddItem "ทิศทางลมไม่ตรงกับหน้าต่าง"
        'value =1
    Me.cboWind_Direct_level.AddItem "ทิศทางลมตรงกับหน้าต่าง แต่ไม่ตั้งฉากกับหน้าต่าง"
        'value =2
    Me.cboWind_Direct_level.AddItem "ทิศทางลมตรงกับหน้าต่าง และตั้งฉากกับหน้าต่าง"
        'value =3

    Me.cboWind_Direct_level.ListIndex = 2

End Sub

Private Sub Print_Click()

End Sub

Private Sub txtAirExchangeRate_GotFocus()

```

```
ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub
```

```
Private Sub txtAirExchangeRate_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtAirExchangeRate_KeyUp(KeyCode As Integer, Shift As Integer)
```

```
    If Trim$(Me.txtAirExchangeRate) <> "" Then
        SetDisableAirExFrame
    Else
        SetEnableAirExFrame
    End If
```

```
    ChkCmdSubmit
```

```
End Sub
```

```
Private Sub SetDisableAirExFrame()
```

```
    Me.txtWindow_Number.Enabled = False
    Me.txtWind_Speed.Enabled = False
    Me.cboWindow_Direction.Enabled = False
    Me.cboWind_Direct_level.Enabled = False
    Me.frmScreen.Enabled = False
```

```
    Me.txtWindow_Number.BackColor = ctrlDisableBg
    Me.txtWind_Speed.BackColor = ctrlDisableBg
    Me.cboWindow_Direction.BackColor = ctrlDisableBg
    Me.cboWind_Direct_level.BackColor = ctrlDisableBg
    Me.frmScreen.BackColor = ctrlDisableBg
```

```
    Me.optScreen.BackColor = ctrlDisableBg
    Me.optWithout_screen.BackColor = ctrlDisableBg
```

```
    Me.lblVtxtWindow_Number.Visible = False
    Me.lblVtxtWind_Speed.Visible = False
```

```
    Me.txtWindow_Number.Text = ""
    Me.txtWind_Speed.Text = ""
    Me.cboWindow_Direction.ListIndex = 0
    Me.cboWind_Direct_level.ListIndex = 0
```

```
    Me.optScreen.Value = True
```

```
End Sub
```

```
Private Sub SetEnableAirExFrame()
```

```
    Me.txtWindow_Number.Enabled = True
    Me.txtWind_Speed.Enabled = True
    Me.cboWindow_Direction.Enabled = True
    Me.cboWind_Direct_level.Enabled = True
    Me.frmScreen.Enabled = True
```

```
    Me.txtWindow_Number.BackColor = ctrlEnableBg
    Me.txtWind_Speed.BackColor = ctrlEnableBg
    Me.cboWindow_Direction.BackColor = ctrlEnableBg
    Me.cboWind_Direct_level.BackColor = ctrlEnableBg
```

```

'Me.frmScreen.BackColor = ctrlEnableBg

'Me.optScreen.BackColor = ctrlEnableBg
'Me.optWithout_screen.BackColor = ctrlEnableBg

Me.IblVtxtWindow_Number.Visible = True
Me.IblVtxtWind_Speed.Visible = True

End Sub
Private Sub txtAirExchangeRate_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtAmount_GotFocus()
    ShowAlertBar Me, Me.IblTopic, Me.IblAlert, Me.picAlert, strValidateDigitGuide
End Sub

Private Sub txtAmount_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateDigit(KeyAscii)
End Sub

Private Sub txtAmount_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtC_Zero_GotFocus()
    ShowAlertBar Me, Me.IblTopic, Me.IblAlert, Me.picAlert, strValidateNumberGuide
End Sub

Private Sub txtC_Zero_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub

Private Sub txtC_Zero_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtC_Out_KeyDown(KeyCode As Integer, Shift As Integer)
    ShowAlertBar Me, Me.IblTopic, Me.IblAlert, Me.picAlert, strValidateNumberGuide
End Sub

Private Sub txtC_Out_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub

Private Sub txtC_Out_KeyUp(KeyCode As Integer, Shift As Integer)
    ChkLblTxt Me.IblVtxtC_Out, Me.txtC_Out
    ChkCmdSubmit
End Sub

Private Sub txtC_Out_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtCin_KeyPress(KeyAscii As Integer)
    KeyAscii = 0
End Sub

Private Sub txtDecayRate_GotFocus()
    ShowAlertBar Me, Me.IblTopic, Me.IblAlert, Me.picAlert, strValidateNumberGuide

```


End Sub

```
Private Sub txtDecayRate_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtDecayRate_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtDust_Cooking_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub
```

```
Private Sub txtDust_Cooking_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtDust_Cooking_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtDust_Other_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub
```

```
Private Sub txtDust_Other_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtDust_Other_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtDust_Smoking_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub
```

```
Private Sub txtDust_Smoking_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtDust_Smoking_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtLoop_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateDigitGuide
End Sub
```

```
Private Sub txtLoop_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateDigit(KeyAscii)
End Sub
```

```
Private Sub txtLoop_KeyUp(KeyCode As Integer, Shift As Integer)
    ChkLblTxt Me.lblVtxtLoop, Me.txtLoop
    ChkCmdSubmit
End Sub
```

```
Private Sub txtLoop_LostFocus()
```

```
HideAlertBar Me.picAlert
End Sub

Private Sub txtTime_Cooking_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateDigitGuide
End Sub

Private Sub txtTime_Cooking_KeyDown(KeyCode As Integer, Shift As Integer)
' If KeyCode = vbEnter Then
'     Me.sstActivity.Tab = 1
'     txtDust_Smoking.SetFocus
'
' Else
' End If

End Sub

Private Sub txtTime_Cooking_KeyPress(KeyAscii As Integer)

    KeyAscii = ValidateDigit(KeyAscii)

End Sub

Private Sub txtTime_Cooking_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtTime_Other_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateDigitGuide
End Sub

Private Sub txtTime_Other_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateDigit(KeyAscii)
End Sub

Private Sub txtTime_Other_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtTime_Smoking_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateDigitGuide
End Sub

Private Sub txtTime_Smoking_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateDigit(KeyAscii)
End Sub

Private Sub txtTime_Smoking_LostFocus()
    HideAlertBar Me.picAlert
End Sub

Private Sub txtVolume_of_House_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub

Private Sub txtVolume_of_House_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
```

End Sub

```
Private Sub txtVolume_of_House_KeyUp(KeyCode As Integer, Shift As Integer)
    ChkLblTxt Me.lblVtxtVolume_of_House, Me.txtVolume_of_House
    ChkCmdSubmit
End Sub
```

```
Private Sub txtVolume_of_House_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtWind_Speed_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateNumberGuide
End Sub
```

```
Private Sub txtWind_Speed_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateNumber(KeyAscii)
End Sub
```

```
Private Sub txtWind_Speed_KeyUp(KeyCode As Integer, Shift As Integer)
    ChkLblTxt Me.lblVtxtWind_Speed, Me.txtWind_Speed
    ChkCmdSubmit
End Sub
```

```
Private Sub txtWind_Speed_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

```
Private Sub txtWindow_Number_GotFocus()
    ShowAlertBar Me, Me.lblTopic, Me.lblAlert, Me.picAlert, strValidateDigitGuide
End Sub
```

```
Private Sub txtWindow_Number_KeyPress(KeyAscii As Integer)
    KeyAscii = ValidateDigit(KeyAscii)
End Sub
```

```
Private Sub txtWindow_Number_KeyUp(KeyCode As Integer, Shift As Integer)
    ChkLblTxt Me.lblVtxtWindow_Number, Me.txtWindow_Number
    ChkCmdSubmit
End Sub
```

```
Private Sub txtWindow_Number_LostFocus()
    HideAlertBar Me.picAlert
End Sub
```

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