



MT-VESS

MECHANICAL CALCULATION OF PRESSURE VESSELS

The software program MT-VESS allows the mechanical design and stability check of pressure vessels. The rating of existing pressure vessels is also allowed. The program runs under WINDOWS 9x/NT/2000/ME/XP operating systems.

The program has been designed to be more generalized as possible, allowing to the project engineer to quick and simply define the vessel configuration and, at the same time, to choose between different Construction Codes.

Vertical columns (one or multiple diameters) and horizontal/vertical pressure vessel can be calculated.

ALLOWED CODES	
ASME VIII division 1	(U.S.A.)
ISPESL-VSR	(Italy) - Harmonized with the PED Directive
AD-MERKBLATT	(Germany) - Harmonized with the PED Directive
EN13445	European Code
PD5500 (App.G)	(U.K.) (Brackets stability check ad Local Loads)

ALLOWED COMPONENTS
<ul style="list-style-type: none"> • Formed Heads (spherical, elliptical, torispherical) • Flat Welded Heads • Flat Flanged Heads • Shell Barrels • Conical Sections • Girth Flanges • Nozzles (Radial, Inclined, Hillside)

ELEMENT TYPES PROVIDED	
Main	Structural resistant elements
Intermediate	Elements to divide the vessel in different pressure chambers
Appendix	Elements with axis is orthogonal to the main vessel axis
Jacket	Elements for exchanging heat with external fluids

SUPPORTS
<ul style="list-style-type: none"> • Saddles • Brackets • Legs • Skirts

NOZZLES
<ul style="list-style-type: none"> • Nominal Diameters from 10 to 1500 mm (3/8" to 60") • Automatic Selection of the construction material from pipe or shell • Automatic verification of the nozzle hole and reinforcement calculation • Nozzle welding analysis

INTERNALS
<ul style="list-style-type: none"> • Demister • Distillation Trays • Packings • Inerts • Catalysts • Liquid Distributors • Coils • Coatings

DATA BANKS	
	The software package is based on large, user modifiable, data banks:
Materials	mechanical properties of over 350 ASME/UNI/EUROMARK materials
Nozzles and Flanges	(ASA, UNI)
Gaskets	(ASME/VSR, AD-MERKBLATT)
ASME Charts for External Pressure	
Standard Supports	Saddles, Brackets, Legs, Skirt
Stiffening Rings	AISC, EUROPEAN
BOLTS	ANSI B18.22, UNI/ISO, DIN 2510

ANALYSIS CAPABILITIES																					
•	<p>Check of stresses caused by internal pressure For each element to user can specify two different pressure and temperature conditions to be verified</p>																				
•	<p>Stability check for loads caused by external pressure. To contrast the external pressure the user can choice between stiffening rings insertion, thickness increase or a combination of both.</p>																				
•	<p>Stability check against combination of different loads: Equipment weight, wind loads, earthquake, user specified forces and/or moments. For Wind and Hearthquake the user can choice between the following Codes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Wind Codes</th> <th style="text-align: left;">Hearthquake Codes</th> </tr> </thead> <tbody> <tr> <td>ANSI</td> <td>ANSI 1982</td> </tr> <tr> <td>ASCE 7-95</td> <td>ASCE 7-95</td> </tr> <tr> <td>CNR 1982</td> <td>CNR 1986</td> </tr> <tr> <td>CNR 1996</td> <td></td> </tr> <tr> <td>DM 2005/OPCM3274</td> <td>DM 2005</td> </tr> <tr> <td>NEIGE ET VENT</td> <td>PARASISMIQUE PS92</td> </tr> <tr> <td>BSI CP 3</td> <td>UBC 1988</td> </tr> <tr> <td>UBC 1994</td> <td>UBC 1994</td> </tr> <tr> <td>UBC 1997</td> <td>UBC 1997</td> </tr> </tbody> </table>	Wind Codes	Hearthquake Codes	ANSI	ANSI 1982	ASCE 7-95	ASCE 7-95	CNR 1982	CNR 1986	CNR 1996		DM 2005/OPCM3274	DM 2005	NEIGE ET VENT	PARASISMIQUE PS92	BSI CP 3	UBC 1988	UBC 1994	UBC 1994	UBC 1997	UBC 1997
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•	Vibration Analysis.
•	Components weight calculation in different conditions: operating, hydraulic test, erection.
•	Stability Check of supports and foundations.
•	Geometrical Dimensioning of the equipment.

OUTPUTS	
	The results of the vessel calculation consist of a Tabular report, Vessel Drawings, Bill of Materials and the Audit Reports Book.
ASCII Report	All relevant data of the vessel are printed out, including the results of numerical calculation and geometrical dimensioning.
Bill of Materials	All components belonging to the vessel under design are summarized in a table with dimensions, weights and number of items. The table can be viewed on screen, printed or exported as Excel file for further processing (i.e. Cost Estimates).
Drawings	<p>The software program automatically generates the equipment drawings in two or more A3 sheets, depending from the complexity of the equipment.</p> <p>In the simplest case the two sheets produced contain the following details:</p> <p>1.st Sheet</p> <ul style="list-style-type: none"> • Project Data • Loads on foundations • Materials • General Notes • Nozzles Specifications • Flanges and Flat Flanged Heads Specifications <p>2.nd Sheet</p> <ul style="list-style-type: none"> • Quoted drawing of the equipment

	<ul style="list-style-type: none"> • Schema for nozzles orientation <p>Drawings can be generated in english or italian language (other languages using latin alphabet can be easily provided) and it is possible to choice between the following system of units:</p> <ul style="list-style-type: none"> • Metric • English • Internazional Standard (S.I.) • User Defined <p>The drawings are produced in DXF format for easy importing them in AUTOCAD, or in many other CAD programs which accept this very popular standard, for further enhancements.</p>
<p>Audit Reports Book</p>	<p>For all the vessel components (or just for someones) datasheets including formulas and substitutions are shown on the screen and can be printed or saved on a file. The user can complement the data sheets automatically printed by the program with:</p> <ul style="list-style-type: none"> • Cover Pages. The included Page Editor, also if simple, allows for an exhaustive text handling and for the insertion of file images in BMP, WMF, JPG formats. • Index of Contents. The program, if so requested, automatically produces an index with pages numbering referred to every component. <p>Datasheets can be produced in English or Italian languages, selecting S.I. or English system of measurement units.</p>
