Nestacionárne vedenie tepla

Ansys spustíte cez *Štart* > *Programy* > *Ansys* > *Ansys* Product Launcher. Potom v záložke *File Management* nastavíte ako pracovný adresár svoj adresár a za *Job Name* dáte napr. Nestac_ved_tepla. Kliknete na *Run*.

1) Zadanie názvu úlohy *Utility Menu > File > Change Title...* /Title, Nestacionárne vedenie tepla 2) Typ úlohy *Preferences* > *Thermal* > *OK* /PMETH,OFF,0 KEYW, PR_THERM, 1 3) Typ elementu ANSYS Main Menu > Preprocessor > Element Type > Add/Edit/Delete... > 'Add' > Select Thermal Mass Solid, Quad 4Node 55 > OK > Close /PREP7 ET.1.PLANE55 4) Materiálové chrakteristiky Preprocessor > Material Props > Material Models > Thermal > Conductivity > Isotropic > KXX = 5MP,KXX,1,5 Preprocessor > Material Props > Material Models > Thermal > Specific Heat > C = 2.04MP,C,1,2.04 Preprocessor > Material Props > Material Models > Thermal > Density > DENS = 920 MP, DENS, 1, 920 5) Vytvorenie oblasti *Preprocessor* > *Modeling* > *Create* > *Areas* > *Rectangle* > *By 2 Corners* X=0, Y=0, Width=1, Height=1BLC4,0,0,1,1 6) Nastavenie veľkosti elementov Preprocessor > Meshing > Size Cntrls > ManualSize > Areas > All Areas > 0.05 AESIZE, ALL, 0.05 7) Rozdelenie na elementy *Preprocessor* > *Meshing* > *Mesh* > *Areas* > *Free* > *Pick All* AMESH,ALL 8) Zadanie typu analýzy Solution > Analysis Type > New Analysis > Transient > OK Otvorí sa okno a označíte Full a dáte OK. ANTYPE.4

9) Nastavenie parametrov pre výpočet Solution > Analysis Type > Sol'n Controls

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10) Zadanie okrajových podmienok

Solution > Define Loads > Apply>Thermal > Temperature > On Nodes Vyberiete Box option (pozri obrázok) a nakreslíte myšou obdĺžnik okolo horných uzlov. OK. Potom zadáte TEMP 500 (pozri obrázok) OK. Potom znovu vyberiete On Nodes, Box option, nakreslíte obdĺžnik okolo dolného radu uzlov a zadáte TEMP 100. OK.



11) Zadanie počiatočných podmienok

Solution > Define Loads > Apply > Initial Condit'n > Define > Pick All (Vybrali ste všetky uzly a zadáte im počiatočnú teplotu 0). *OK*.

▲ Define Initial Con	ditions			×
[IC] Define Initial Cond	litions on Nodes			
Lab DOF to be spec	fied		TEMP	-
VALUE Initial value of	DOF		0	_
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12) Spustenie riešenia

Solution > Solve > Current LS SOLVE

13) Vizualizácia výsledkov

General Postproc > Plot Results > Contour Plot > Nodal Solu ... > DOF solution, Nodal Temperature

14) Vytvorenie animácie dát

Utility Menu > PlotCtrls > Style > Contours > Uniform Contours... Ako NCONT (počet kontúr) zadáte 8, potom vyberiete *User specified*, a minimálnu hodnotu kontúry zadáte 0 a maximálnu 500. Dáte OK.

15) Animácia dát

Utility Menu > PlotCtrls > Animate > Over Time...

Nastavíte počet obrazov (*Number of animation frames*) 20, vyberiete *Time Range* a ako *Range Minimum* a *Maximum zadáte* hodnoty 0 a 300. *Auto countour scaling* dáte *OFF*, *animation time* 0.5 a vyberiete, aby Vám zobrazil *DOF solution* a *Temperature TEMP*. *OK*. Počas animácie môžete skúsiť meniť rýchlosť animácie, animovať iba smerom dopredu....

16) Zobrazenie priebehu teploty v konkrétnom uzle

Main Menu > TimeHist Postpro

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Kliknete na tlačítko hore vľavo a pridáte premennú. Vyberiete *Nodal Solution* > DOF *Solution* > *Temperature* a dáte *OK*. Vyberiete niektorý z uzlov a dáte *OK*. Malo by sa Vám zobraziť okno:

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Kliknete na tlačítko a zobrazí sa Vám priebeh teploty v danom uzle v závislosti od času. Označenie osí zmeníte v *Utility Menu > Plot Ctrls > Style > Graphs > Modify Axes* a premenujete X a Y axis, dáte znovu vykresliť.