Pore-Cor Research Suite Electronic Brochure data files

	Sample	Pore-Cor	Pore-Comp	Pore-Ped	Description	Advice	Properties	Literature
ROCK	Clashac outcrop sandstone	✓			Standard, clean, outcrop sandstone. Quarried in Scotland. Used in many Pore-Cor tutorials because the mercury intrusion curve is a straightforward S-shape. However, notice that the datafile has only a few points. The simulated curve therefore wanders freely between them, as it makes no assumptions about smoothing of the curve between the measured points.	A good one to try to start with. Very easy to fit	Permeability OK. Microtome gives fragment estimates which are much better than capillary bundle model. Try colloid block to simulate formation damage, and re-calculate permeability.	Matthews, G.P., Moss, A.K., Spearing, M.C. and Voland, F. (1993) Network calculation of mercury intrusion and absolute permeability in sandstone and other porous-media. Powder Technology. 76, 95-107. Matthews, G.P., Ridgway, C.J. and Small, J.S. (1996) Modeling of simulated clay precipitation within reservoir sandstones. Mar. Pet. Geol. 13, 581-589. Matthews, G.P., Moss, A.K. and Ridgway, C.J. (1995) The effects of correlated networks on mercury intrusion simulations and permeabilities of sandstone and other porous-media. Powder Technology. 83, 61-77. An Application note on the Pore-Cor website (search for 'Formation damage') gives more detail about studies of formation damage in sandstone.
	Fontainebleau Sandstone	✓			Sandstone quarried from Fontainebleau near Paris. The degree of cementation of the sandstone varies with depth in the quarry, giving porosities varying from around 35% to as little as 4%. This sample is in the middle of the range. The cementation and/or inclusions are represented by the zone of small pores and throats in the centre of the unit cell.	Quite easy to fit. Shows what a cemented sandstone looks like, so interesting to compare this with Clashac if you are an oil engineer or special core analyst.	Try the colloid block algorithm to show what colloid and clay inclusions do to the structure and its permeability.	
	Granite	✓			A cracked granite of very low porosity being studied by EOST, Université Louis Pasteur, Strasbourg. The mercury intrusion curve has a long, low pressure tail, which is fitted using a Large Surface Throats structure type. The anisotropy is a realistic value for samples of this type.	Very difficult to fit, but fascinating example of an anisotropic low porosity sample	EOST reports that the simulated permeabilities for their structures are realistic. Enjoy trying to see the tiny features if you tour around it in Virtual Reality	

	Sample	Pore-Cor	Pore-Comp	Pore-Ped	Description	Advice	Properties	Literature
SOIL	Clay loam	✓		✓	Clay Loam. & Water retention curve generated using Pore-Ped, based on the NSRI pedo-transfer function. Composition 33% Sand, 37% Silt, 30% Clay, with a low bulk density of 1.2 g cm^{-3}, and no organic carbon content. Note the difference in water retention curve, and hence structure, from 'Loamy Sand'.	Try these if you are a soil scientist, understand water retention experiments, and have made yourself familiar with Pore-Ped.	Permeability (i.e. saturated hydraulic conductivity) can be calculated with care, if pore skew is kept low. Simulate the effects of an oil spill into soil using polymer pore plug.	Peat, D.M.W., Matthews, G.P., Worsfold, P.J., and Jarvis, S.C. (2000) Simulation of water retention and hydraulic conductivity in soil using a three-dimensional network. European J. Soil. Sci 51, 65-79. Johnson, A., Roy, I.M., Matthews, G.P., and Patel D. (2003) An improved simulation of void structure, water retention and hydraulic conductivity in soil, using the Pore-Cor three-dimensional network. European Journal of Soil Science, 54,477-489.
	Loamy sand	✓		✓	Loamy Sand. & Water retention curve generated using Pore-Ped, based on the NSRI pedo-transfer function. Composition 84% Sand, 9% Silt, 7% Clay, with a low bulk density of 1.2 g cm^{-3}, and no organic carbon content. Note the difference in water retention curve, and hence structure, from 'Clay Loam'.			
PAPER	Pore-Comp Paper Coating	✓	Supplied with Micromeritics version		A paper coating made from a platey kaolin clay called Speswhite, marketed by Imerys. It has no added CMC (carboxy methyl cellulose) surfactant. The file is derived from a file corrected by Pore-Comp, which had a large intrusion step below pressures of 1 MPa. The coating on its substrate had been coiled and fitted into the sample chamber in a roll. So this low pressure step represents intrusion of mercury between the layers of the roll, and so was chopped off using the Pore-Comp Trim tool.	The result of the compression-corrected file from the Pore-Comp examples. Quite easy to fit.	The publications explains what happens if you try to wet paper coatings structures. You can try this yourself, but beware of using wetting times longer than abut 100 ms , as they will take a very long time to calculate. See how the calculation is progressing by clicking the other Pore-Cor screen tab at the bottom of your computer screen, which will open a DOS monitoring window. You can minimise this window, but switching it off will crash the program . The third publication on the right tells you about simulating particles in the structure.	Schoelkopf, J., Gane, P. A. C. , Ridgway, C. J. and Matthews, G. P. (2001) Influence of Inertia on Liquid Absorption into Paper Coating Structures, Nordic Pulp and Paper Research Journal, 15 , 422-430. Bodurtha, PA., Matthews,G.P., Kettle, J.P.and Roy, I.M. (2005) Influence of anisotropy on the dynamic wetting and permeation of paper coatings. J.Colloid and Interface Science, 283, 171-189. Laudone, G.M., Matthews G.P., Gane P.A.C, Ridgway C.J. and Schoelkopf J., (2005) Estimation of the effective particle sizes within a paper coating layer using a void network model, Chemical Engineering Science, in press.
	Paper coating	✓			A paper coating comprising Amazon Clay with starch and latex binders, coated onto an impermeable substrate. Note that the unit cell is anisotropic (squashed in the vertical direction. This reflects the anisotropic shape of pores produced when the clay particles are coated onto the substrate with a blade.	Difficult to fit, but does illustrate anisotropic structures.		

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GLASS	Pore glass	✓			A controlled pore glass, made from borosilicate base material which has been treated to give voids over a narrow range of sizes. In this sample, the point of inflection of the mercury intrusion curve occurs at 170 Angstroms or 17 nm or 1.7e-2 µm(microns). This can be confirmed by viewing the mercury intrusion curve, selecting linear X-axis by switching of the logarithmic X-axis option shown on the Chart drop-down menu. The simulated void structure has voids close to this size, but does not agree with the capillary bundle approximation (which would give a maximum number of voids of size 17 nm).	Quite easy to fit, and shows what to expect from a standard / calibration sample with a very small range of pore sizes.	Click on the pore and throat size distribution to see the very narrow range of values. use the graph drop-down menu to change the axes from log to linear and vice-versa if they look odd.	
CEMENT	Pore-Comp Cement	✓	Supplied with Thermo Electron version		The research group led by the late Prof J. Cabrera of Leeds University had some success in using Pore-Cor to model cement. However, we know nothing about the provenance of this sample which was supplied by Thermo Electron. The datafile is the same as that produced by the Pore-Comp cement demonstration file i.e. it has already been corrected for sample compression.	This one is a bit of a mystery – try it if you are an engineer !	Why not try to see what particles look like in his structure.	Laudone, G.M., Matthews G.P., Gane P.A.C, Ridgway C.J. and Schoelkopf J., (2005) Estimation of the effective particle sizes within a paper coating layer using a void network model, Chemical Engineering Science, in press.
METAL	Sinter	✓			A fragment of a sintered metal casting, used for applications such as cylinder heads for high performance car engines, and car air-conditioning compressors. An unsuccessful attempt has been made to impregnate the casting with resin to seal any leaks. Hence the permeable zones, which can be viewed in Virtual Reality.	This one can be tried if you are interested in sinters, castings or filters. Quite difficult to fit.	Have a look at the structure in virtual reality. All the transparent areas, that you can move through, are either solid metal or impregnated voids.	An Application note on the Pore-Cor website (search for 'sinters') gives more detail about this.