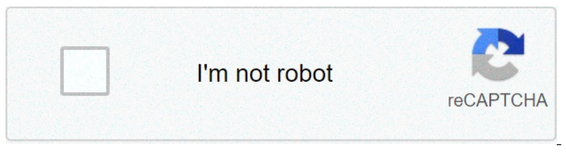

Continue

Clean room hvac design calculations pdf

Clean room hvac design calculations pdf. How to design hvac system for clean room.

07-17-2010, 04:52 PM # 1 Room type: Clean room pharmaceutical Volume: 5008 Ft ^ 3 ACPH: 80 CFM selected: 6680 Heat Sensitive total: 47565 BTU / Hr Total Heat: 49380 BTU / Hr external Condition: 102.2 F (DB); 96.1 F (WB); 80% RH internal Condition: 71.6 F (DB); 50% RH Pressure Rom: 42.5 Fresh air This is the data that I have and I need help to calculate the tonnage of the cooling coil. Please send some links on how to calculate the load of the coil to a clean room system where ACPH is much higher. I am having trouble in this calculation of the rear cooling tonnage. 07-17-2010, 05:06 PM # 2 80 air changes is high enough, it's like a class 10 clean room or something to wear bunny costumes? Sara 'a hurricane in that room. If this is actually your load requirement and air exchange then you would be better off to obtain a unit that can give 47565 Btu / hr sensible cooling and blow the cooled air at the end of another fan ass that sucks and HEPA filters a further 4680 CFM return air. The filtering unit moves the CFM 6700, the AC cools according 2000 to 2100 CFM, the rest of the air is just for the return stroke through the filters. The way we build has a greater impact on our comfort, energy consumption and IAQ than any HVAC system that we install. 07-17-2010, 05:23 PM # 3 During this calculation of tonnage, I have to consider only the CFM necessary to compensate for the sensible heat or the selected CFM of the room (this is a tonnage of highest rear cooling)? 07-17-2010, 09:07 PM # 4 have a very high airflow 5008 x 80/60 = 6677 CFM to get air through the filters 80 times per hour. typically air conditioning works of about 20 degrees F temperature, may be more or less. But it is a kind of rediculous 6677 CFM put through a coil winding only to extract 47565 Btu / hr from it. So it would be better to try to cool approximately 47565 / 1.1 / 20 = 2162 CFM off of 20 degrees and then provide in a unit of filtration that manages the 6677 CFM The way in which we construct has a greater impact on our comfort, energy consumption and IAQ than any HVAC system that we install. 07-18-2010, 01:33 AM # 5 So the loads are: equipment, lights and plug loads, occupants, process, fan heat, td gain through the envelope, and dares? I miss something? The more or less, you will need to de-rate your cooling cap due to low internal conditions and hi outdoors. The specified load calculation includes all of the above? You're on the hook for the load capacity calc / system or entrusting the job to someone else. OSA posted for the spec is about 12,300 according to the EZ Air (Buy). cfm x 4.5 x H diff (64-25) or 70 x 4.5 x 29 I guess you'll have to do some 'humidification and heating with controls to achieve a spec narrow room. You're probably already aware, but I'll say it anyway, your volume of cooling and volume circulated to the EPAS are two different paths / fan circulated that draw from the same low return plenum. The volume of cooling then discharged in EPA path before the fan. The simple cooling fan could never approach the required volume or SP requirements hepa design. sounds like you (9) 2 x 4 hepas powered fan. The pharmaceutical customer will sign w / printed or design engineers? go here for some simple concepts Psychro: 20chart.pdf Last update by btuhack; 07-18-2010 02:26 AM. 07-18-2010, 09:18 AM # 6'm trying to understand the discrepancy between two calculations that have been provided for the same clean room. One of them shows 6.5 TR rear cooling and another shows 16.5 (rear cooling) + 1TR pre-cooling. As far as I understand, the first negotiated only with CFM required to compensate for sensitive heat and the second counted the selected CFM for the calculation of tonnage. Space loads are equal but the load of the coil differs. Actually this selected CFM is for two rooms with the same conditions as required. 1st room: 3946CFM [SH: 20534 20534-- How did you calculate the return CFM? Please explain. Also please explain the procedure of control of tonnage calculation. I'm going around circles! @btuhack There will be FFU in the rooms. 07-18-2010, 10:52 AM #7 I think something is lost in translation. I also noticed that your outdoor condition would have tied a world record for the dew point set in the Persian Gulf area, so this is a bit suspicious The way we build has a greater impact on our comfort, energy consumption and IAQ than any HVAC system we install. 07-18-2010, 12:40 PM #8 ok. Please explain whether to select the total CFM or only the required CFM to compensate for the reasonable heat for the calculation of the stable? 07-18-2010, 01:12 PM #9 Is that what you're doing, like? If so, the Coil Cfm is what it takes to manage the heat load, and the balance is deviated to recirculation fans. The coil/flow is combined with the load calf. The circulated chamber volume is determined by the process; laminare, ach, whatever you want to call and has nothing to do with the heat load. As Carnak says, "it's a long ride." Am I on the right path or are you asking for something else? 07-18-2010, 02:44 PM #10 Originally published by ruzfactor ok. Please explain whether to select the total CFM or only the required CFM to compensate for the reasonable heat for the calculation of the stable? the total CFM is the air flow necessary to give you 80 air changes per hour. It means that your clean room requires that you perform all the air in the clean room through filters 80 times per hour. I never had to have this high change of air in everything I've ever done. The reasonable calculation of heat, determined how much air flow had to be cooled by 20 degrees F, to give you the reasonable cooling required. So I suggested getting a system that gives you the reasonable cooling needed and moves a amount of air similar to what I calculated. This gives you cooling and saves energy compared to pull the additional 4000 plus CFM through a cooling coil. The published schematic btuhack shows a cooling system that provides air to the individual laminar flow units. The cooled air is fed to these units and at the same time, the return air is pulled through these units and filtered as well I am not quite sure what it means by "TR" and I have no idea what "return cooling" is Last modified by Carnak; 07-18-2010 at 03:27 PM. The way we build has a greater impact on our comfort, energy consumption and IAQ than any HVAC system we install. 07-24-2010, 09:51 AM #11 @Carnak TR= Refrigeration ton Let me tell you what I got from the summary sheet of the two rooms. I have to find out what the basis of this design is: Room grade: B ACPH: 80 Pressure: 40-45 Pa Design Time: 22(+- 3) C and RH= 55 (+-5) Outdoor: 39 C RH= ____ Room 1: Area 301 FT^2 Volm - 2959 FT^3 RSH=20534 BTU/Hr RTH=20597 BTU/HrTotal Heat (including the heat of outdoor air): 21376 BTU / HR Air Flow (dehumidified): 1003 CFM Air Flow (volumetric): 3946 CFM Camera 2: Area 208 ft ^ 2 Volm - 2049 ft ^ 3 RSH = 27031 BTU / HR RTH = 27455 BTU / HR Grand Total Heat (including outdoor air heat): 28004 BTU / HR Air Flow: 1325 cfm Air flow (volumetric): 2732 CFM ------- -- -- -- ---------------- Estimate of the heat load Summary: Selected CFM: 6680 CFM infiltration: 100 Return CFM: 6780 BYPASS CFM: 4350 Fresh air CFM: 70 PURGE CFM: 1 70 Tonnage: 6.5 tr Static mm WC: 125 Fan: 7.5 kW Heating: 2.0 kW ------------------------------ -- -- ------------------- Someone can explain this design procedure ?? Because for the same design condition I received a tonnage of 16.5 tr !!!! 07-24-2010, 10:28 am # 12 You should start listening, how you are coming and the room loads of sensitive heat. I 49000 49000 The heat in such small areas looks intense, as is a Grow-Op hyrodpononic - Internal agriculture with a lot of lights. Then work the heat load generated inside the rooms and add it to any heat that enters between the walls, the windows, through the roof and or up to the floor. That sensible load defines the amount of air necessary for cooling (or what the load sheets call dehumidified cfm) so as to solve the air flow dehumidified by the sesgibile load of the room. This gives you your cfm and your required dry power bulb and moist bulb. Now with clean rooms, pressurize them so that clean air loses out of clean space, this keeps the air dirty out of clean space. I noticed the infiltration listed in the calculations. If you're infiltrated in the clean room, you're in big trouble. So you work how much outdoor air you need to build the pressure, in order to make the air loss dry clean from the clean room. Avoid your entry condition for the cooling part of your process. Then draw in the air of the room plus your volume of outdoor air. You get the mixed air conditions and your big total heat is the required cooling to take this mixed air up to the dry bulb and the wet bulb you need to provide to the space. Anyway, I think the 49,000 BTU / HR is high to start and I don't see how it becomes 6.5 tons. 16.5 tons seem even further away from me, perhaps you are out of a decimal point on that dew point of the world records a fresh air volume, you are bringing it to ten times higher than what is defined the last time by Carnak; 07-24-2010 at 10:47. The way we build has a greater impact on our comfort, energy consumption and IAQ than any HVAC system we install. 07-24-2010, â 01:00 PM # 13 I checked the cooling load calculation and found it correct. How do I calculate the dehumidified cfm? From this > qs = 1.08 x cfm x t (interior design temp â € "Cooling Coil Temp" What should be the cooling coil temp? Is it from the psychometric chart using SHF? For example, if the rooms have pressures of 45 pa and saying that another room adjacent to that has 50 pavilions, then there should be some air infiltration from room 50PA to 45 padia. Isn't it? In addition, ACPH * Volume = cfm: gives me the required cfm for the room. Is this formula applicable here? 07-24-2010, â 02:23 PM # 14 Which is correct, 49000, 6.5 tons or 16,5 tons? CFM = QS / (Temperature change 1.08 x), RETURN TIME - AIR TEMP ALIMENT. where qs is the heat sensible from the room. You will have to do some research alone here, I will not teach you PsychromtetiRCS in one thread, but you decide what is about to be the air temperature supply and then work the cfm, 20 degrees cooling The room is a common temp, you may have a cooling of 15 degrees if you wanted in your particular situation. If you return to the clean rooms, you should have a plane block in the middle. The clean rooms are positive because you are always pumping in outdoor air, the adjacent airline would negative probably has a exhaust fan in there. You want to clean the air out of a clean room, you don't want the air out of a clean room to lose. This is fundamental, no infiltration!!!! ACPH X VOLUME = Cubic feet per hour ACPH VOLUME X / 60 = CFM (Cubbic stones per minute) In your case it should be 80 air changes, it means that all the air in the rooms passes through filters 80 times per hour. The way we build has a greater impact on our comfort, energy consumption and IAQ than any HVAC system we install. 07-26-2010, ÂAM #15 I know the Pyschrometric and how to calculate the load from it. But, I don't want to. My question is, if it's a white room, is there any other way to design HVAC for this? I am confused which is correct, 16.5 (with 1.5 prefreshing) or 6.5 tons!! Because, one with 16.5 is saying for the clean room, it is necessary to consider the (ACPH * Volume / 60 = cfm) to estimate the load of the AHU coil and also needs fresh air. How far awayHo capito, 6.5 si basa sul CFM necessary per compensare il carico ragionevole. Question is dove sleep bloccato!! And per l'infiltrazione, uno con 6.5 TR considerto!! 07-26-2010, 12:38 PM #16 Troverete le risposte in tutte le risposte precedenti, le leggere di nuovo...o avere un ingegnere fare i calchi, progettare il system, and spec l'apparecchiatura, in questo mode, si può concentrasi sull'installazione. Dopo che il lavoro sara' finito, ne avrai uno sotto la waist. Last modified btuhack; 07-26-2010 alle 10:57. 08-17-2010, 10:11 #17 Credo che forse ci manchi l'aria di scarico qui. If la stanza è una press negative and lo scarico è semplicemente scaricato con il recupero di qualsiasi type, allora sono con il ragazzo che ti dice 16.5 TR6.5. Anche in quegli 80 cambi d'aria avete 4200 cfm di aria esterna a 102.2 ° Fdb/96.1°Fwb da trattare. 08-25-2010, 09:18 AM #18 Ho allegato qui una Guida pra di Ashrae Journal su "Progettare la camera di pulizia HVAC System". Spero che questo pode aiutarvi un po' . datarec. ru/files/schneider.pdf 08-25-2010, 10:13 AM #19 "La mia domanda è, se è una camera pulita, c'è qualche altro mode per progettare HVAC per esso? Sono confusing che uno è corretto, 16.5 (con 1.5 pre raffreddamento) the 6.5 Ton!! Poiché, uno con 16.5 sta dicendo per camera pulita, è necessario considerare il (ACPH*Volume/60=CFM) per stimare il carico della coil AHU and anche bisogno di pre raffreddare l'aria fresco. Per como ho capito, 6.5 si basa sul CFM necessario per compensare il carico ragionevole. Qui sono bloccato!" Il link di Herohero è una buona spiegazione. Sembra che i cambiamenti dell'aria ti stiano buttando via. Gli 80 ACHs devono jailsi cura della pulizia dello spazio non condizionarlo. A 80 ACHs la temperatura dello spazio sarà fondamentalmente la temperatura dell'aria di feedzione. In un A/C standard l'aria viene raffreddata per dire 75 to 55 and fornita nello spazio and si mescola con l'aria della stanza per fornire la temperatura corretta. If tutti gli 80 ACH sono stati raffreddati a 55 deg (16.5 TR) allora lo spazio sarebbe troppo freddo. L'approccio di progettazione dovrebbe essere quello di calcolare tutti i carichi (geria esterna, persone/equipment, perdita di busta, ecc.) e la dimensione della coil di raffreddamento per quel carico. Il resto è solo la circuslazione dell'aria attraverso filtri HEPA per mantenere lo spazio pulito. Di solito c'è un piccolo maniglione di raffreddamento che feeding il più grande sistema di alimentazione HEPA. Spero che questo aiuti. A proposito, non dimenticare il guadagno di calore dal system ventilatore HEPA. Può essere piuttosto significant. Come ha detto il btuhack, potrebbe voler assumere un ingegnere per la prima. 07-20-2012, 02:41 AM #20 expensive signore potrebbe dirmi come si calcola questo tutto come io m molto confusing per il calcolo del riscaldo KW waitin per risposta

introduction to fluid mechanics by som and biswas pdf