*CTE HE 1.Opción simplificada mediante fichas.*

**1.- Datos iniciales de la vivienda**

**2.- Determinación de la zona climática**

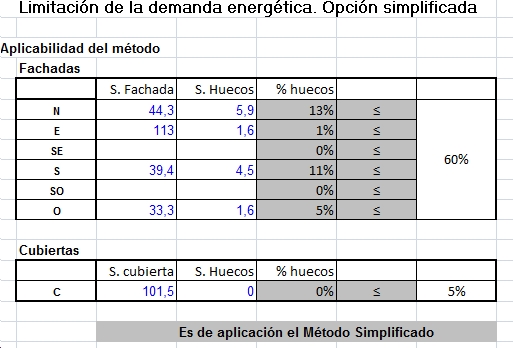
**3.- Definición de la envolvente térmica**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ENVOLVENTE TÉRMICA** | | | | | | |
| Cerramientos | | | Orientación | Superficie | Contacto | Parámetro |
| Cubiertas | Forjado sobre planta | | **-** | **101.5** | **Con espacio no habitable** | **UC2** |
| Muros | Fachada principal | | **S** | **22.5** | **Exterior** | **UM1** |
| Fachada posterior | | **N** | **23.8** |
| Entrada | | **O** | **5** |
| Entrada | | **E** | **5** |
| Porción de fachada | | **E** | **3.5** |
| Partición interior garaje | | **E** | **24.9** | **Espacio no habitable** | **UM2** |
| Acceso garaje | | **S** | **5** |
| Acceso garaje | | **N** | **5** |
| Tabique escaleras | | **S** | **8.9** |
| Tabique escaleras | | **O** | **3.2** |
| Tabique escaleras | | **N** | **7.6** |
| Acceso sala de calderas | | **N** | **3.5** |
| Medianera | | **O** | **25** | **Otro edificio** | **UMD** |
| Suelos | Forjado sanitario | | **-** | **101.5** | **Cámara sanitaria** | **US2** |
| Huecos | Ventanas | | **N** | **4.3** | **Exterior** | **UH y FH** |
| **S** | **2.9** |
| Puertas | Principal | **S** | **1.6** | **Exterior** | **UH** |
| Pasillo-garaje | **E** | **1.6** | **Espacio no habitable** |
| Escaleras desván | **O** | **1.6** |
| Sala calderas | **N** | **1.6** |

**4.- Clasificación de los espacios del edificio**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EDIFICIO** | | **ESPACIO** | | | |
| PLANTA | RECINTO | HABITABLE | | | NO HABITABLE |
| Carga interna | | Higrometría |
| Baja | Alta |
| Cámara sanitaria | Cámara sanitaria | - |  | - | X |
| Baja | Cocina | X |  | 3 | - |
| Salon | X |  | 3 | - |
| Dorm 2 | X |  | 3 | - |
| Pasillo | X |  | 3 | - |
| Baño 2 | X |  | 3 | - |
| Ropero | X |  | 3 | - |
| Baño1 | X |  | 3 | - |
| Dorm 1 | X |  | 3 | - |
| Sala de calderas | X |  | 3 | X |
| Garaje | X |  | 3 | X |
| Dorm 3 | X |  | 3 | - |
| Primera | Desván | X |  | 3 | X |

**5.- Comprobar la aplicabilidad**



**6.- Cumplimiento de las limitaciones de la permeabilidad al aire**

…… es Zona Climática …., con lo cual, la permeabilidad al aire de las ventanas y marcos será inferior a … m3/hm2. Si en el catálogo de las mismas, su permeabilidad es inferior, los huecos CUMPLEN con la permeabilidad al aire

**7.- Cálculo de los parámetros característicos**

**8.- Limitación de la demanda energética**

Comprobación de las transmitancias térmicas y su cumplimiento según la tabla 2.1:

|  |  |  |  |
| --- | --- | --- | --- |
| **CERRAMIENTOS Y PARTICIONES INTERIORES** | **Clase** | **U (W/M2K)** | |
| **Proyecto** | **Máxima** |
| **Muros de fachada** | **UM1** | **0.55** |  |
| **Particiones interiores en contacto con espacios no habitables** | **UM2** | **0.47 (acceso garaje)**  **0.51 (tabiques escaleras)**  **0.52 (acceso calderas)** |
| **Suelos** | **US2** | **0.35** |  |
| **Cubiertas** | **UC2** | **0.55** |  |
| **Vidrios de huecos y lucernarios** | **Uh,V** | **3.3** |  |
| **Marcos de huecos y lucernarios** | **Uh,M** | **3.2** |
| **Medianerías** | **UMD** | **0.51** |  |

## Cálculo de los parámetros característicos medios

|  |  |  |  |
| --- | --- | --- | --- |
| **ZONA CLIMÁTICA** |  | **Zona de baja carga interna** | **Zona de alta carga interna** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **MUROS (UMm) y (UTm)** | | | | | | |
| Tipos | | A (m2) | U (W/m2 ºK) | A· U (W/ºK) | Resultados | |
| N NEN |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| EN |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| O |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| S |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| SE |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| SO |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UMm=∑A· U / ∑A= |  |
| C-TER |  |  |  |  | ∑A= |  |
|  |  |  |  | ∑A· U= |  |
|  |  |  |  | UTm=∑A· U / ∑A= |  |
|  | | | | | | |
| **SUELOS (USm)** | | | | | | |
| Tipos | | A (m2) | U (W/m2 ºK) | A· U (W/ºK) | Resultados | |
|  | |  |  |  | ∑A= |  |
|  | |  |  |  | ∑A· U= |  |
|  | |  |  |  | USm=∑A· U / ∑A= |  |
|  | | | | | | |
| **CUBIERTAS Y LUCERNARIOS (UCm, FLm)** | | | | | | |
| Tipos | | A (m2) | U (W/m2 ºK) | A· U (W/ºK) | Resultados | |
|  | |  |  |  | ∑A= |  |
|  | |  |  |  | ∑A· U= |  |
|  | |  |  |  | UCm=∑A· U / ∑A= |  |
|  | |  |  |  |  |  |
| Tipos | | A (m2) | F | A· F(m2) | Resultados | Tipos |
|  | |  |  |  | ∑A= |  |
|  | |  |  |  | ∑A· F= |  |
|  | |  |  |  | FHm=∑A· F / ∑A= |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **ZONA CLIMÁTICA** |  | **Zona de baja carga interna** | **Zona de alta carga interna** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **HUECOS (UHm , FHm)** | | | | | | | | | | | | | | | | | | | |
| Tipos | | | | A (m2) | | | U(W/m2 ºK) | | | | | A· U (W/ºK) | | | | Resultados | | | |
| N | |  | |  | | |  | | | | |  | | | | ∑A= | |  | |
|  | |  | | |  | | | | |  | | | | ∑A· U= | |  | |
|  | |  | | |  | | | | |  | | | | UHm=∑A· U / ∑A= | |  | |
|  | | | | | | | | | | | | | | | | | | | |
| Tipos | | | | A (m2) | | U | | | F | | A· U | | | A· F(m2) | | Resultados | | Tipos | |
| E | |  | |  | |  | | |  | |  | | |  | | ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· U= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· F= | |  | |
|  | |  | |  | | |  | |  | | |  | | UHm=∑A· U/∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | FHm=∑A· F / ∑A= | |  | |
| O | |  | |  | |  | | |  | |  | | |  | | ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· U= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· F= | |  | |
|  | |  | |  | | |  | |  | | |  | | UHm=∑A· U / ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | FHm=∑A· F / ∑A= | |  | |
| S | |  | |  | |  | | |  | |  | | |  | | ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· U= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· F= | |  | |
|  | |  | |  | | |  | |  | | |  | | UHm =∑A· U / ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | FHm =∑A· F / ∑A= | |  | |
| SE | |  | |  | |  | | |  | |  | | |  | | ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· U= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· F= | |  | |
|  | |  | |  | | |  | |  | | |  | | UHm =∑A· U / ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | FHm =∑A· F / ∑A= | |  | |
| SO | |  | |  | |  | | |  | |  | | |  | | ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· U= | |  | |
|  | |  | |  | | |  | |  | | |  | | ∑A· F= | |  | |
|  | |  | |  | | |  | |  | | |  | | UHm =∑A· U / ∑A= | |  | |
|  | |  | |  | | |  | |  | | |  | | FHm =∑A· F / ∑A= | |  | |

**FICHA 2 CONFORMIDAD- Demanda energética**

|  |  |  |  |
| --- | --- | --- | --- |
| **ZONA CLIMÁTICA** |  | **Zona de baja carga interna** | **Zona de alta carga interna** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Cerramientos y particiones interiores de la envolvente térmica** | **Umax(proyecto)**(1) |  | **Umax**(2) |
| Muros de fachada |  |  |  |
| Primer metro del perímetro de suelos apoyados y muros en contacto con el terreno |  | ≤ |  |
| Particiones interiores en contacto con espacios no habitables |  |  |  |
| Suelos |  | ≤ |  |
| Cubiertas |  | ≤ |  |
| Vidrios de huecos y lucernarios |  | ≤ |  |
| Marcos de huecos y lucernarios |  |
| Medianerías |  | ≤ |  |
|  |  |  |  |
| Particiones interiores (edificios de viviendas)(3) |  | ≤ |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MUROS DE FACHADA** | | | |  | **HUECOS Y LUCERNARIOS** | | | | | | |
|  | **UMm**(4) |  | **UMlim**(5) |  | **UHm**(4) |  | **UHlim**(5) |  | **FHm**(4) |  | **FHlim**(5) |
| N |  |  |  |  |  | ≤ |  |  |  |  |  |
| E |  |  |  |  |  | ≤ |  |  |  | ≤ |  |
| O |  | ≤ |  |  |  |  |  |
| S |  |  |  | ≤ |  |  |  | ≤ |  |
| SE |  |  |  |  |  | ≤ |  |  |  | ≤ |  |
| SO |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CERR. CONTACTO TERRENO** | | |  | **SUELOS** | | |  | **CUBIERTAS** | | |  | **LUCERNARIOS** | | |
| **UTm**(4) |  | **UMlim**(5) |  | **USm**(4) |  | **USlim**(5) |  | **UCm**(4) |  | **UClim**(5) |  | **FLm** |  | **FLlim** |
|  | ≤ |  |  |  | ≤ |  |  |  | ≤ |  |  |  | ≤ |  |

(1) Umax(proyecto)corresponde al mayor valor de la transmitancia de los cerramientos o particiones interiores indicados en proyecto.

(2) Umax corresponde a la transmitancia térmica máxima definida en la tabla 2.1 para cada tipo de cerramiento o partición interior.

**(**3) En edificios de viviendas, Umax(proyecto)de particiones interiores que limiten unidades de uso con un sistema de calefacción previsto desde proyecto con las zonas comunes no calefactadas.

**(4)** Parámetros característicos medios obtenidos en la ficha 1.

**(5)** Valores límite de los parámetros característicos medios definidos en la tabla 2.2.

**9.- Control de las condensaciones**

Resolverlas con la Hoja de cálculo

**10.- Tablas de soluciones técnicas para la obtención de la clase D**