Introduction
Thistle X-Ray is an undercoat plaster for use in suitable backgrounds where protection from X-rays is required e.g. areas within hospitals/dental surgeries. Thistle X-Ray has a controlled set, and provides a coating which is free from shrinkage cracks.

Thistle X-Ray is a retarded hemihydrate, pre-mixed gypsum plaster incorporating barytes aggregate, requiring only the addition of clean water to prepare it for use. With a final coat of Gyproc Skimcoat or Carlite Finish, Thistle X-Ray provides a smooth, inert, high quality surface to internal walls and ceilings and a durable base for the application of decorative finishes.

Reaction to Fire
The plasters are non-combustible when tested in accordance with BS 476: Part 4 1970 (Amended 1984). For the purpose of the Building Regulations 1997, gypsum plasters are designated non-combustible materials, (Technical Guidance Document B). Gypsum plasters also satisfy the requirements for Class O surfaces.

Effect of Temperature
It is recommended that the background temperature should be at least 5°C and that the plaster should not be subjected to temperatures below 5°C before it has set. Dry bagged plaster is not affected by low temperatures.

The plaster is not suitable for use in situations where the temperature exceeds 43°C.

Storage
The plaster should be stored dry, as the absorption of moisture by any gypsum plaster shortens the setting time and may reduce the strength of the set plaster. Where storage areas have concrete floors, timber platforms should be laid and the plaster stored on these. The shelf life of Thistle X-Ray is 16 weeks.

Radiation Control
The normal way of expressing the resistance of any substance to X-rays is by comparison with lead sheet. For example, with an X-ray tube potential of 75kV, an application of 20mm of Thistle X-Ray gives the same protection as a lead sheet 2mm thick.

The table below lists three typical plaster thicknesses against lead equivalence for six tube voltages from 50kV to 200kV.

Where plastering over rib-lath, the thickness of plaster required should be measured from the face of the lath.

<table>
<thead>
<tr>
<th>Plaster Thickness</th>
<th>50kV</th>
<th>75kV</th>
<th>100kV</th>
<th>125kV</th>
<th>150kV</th>
<th>200kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>15mm</td>
<td>0.56</td>
<td>1.41</td>
<td>1.33</td>
<td>0.96</td>
<td>0.70</td>
<td>0.56</td>
</tr>
<tr>
<td>20mm</td>
<td>0.88</td>
<td>2.00</td>
<td>1.92</td>
<td>1.33</td>
<td>1.02</td>
<td>0.79</td>
</tr>
<tr>
<td>25mm</td>
<td>1.08</td>
<td>2.41</td>
<td>2.33</td>
<td>1.53</td>
<td>1.24</td>
<td>1.03</td>
</tr>
</tbody>
</table>

Note: The lead equivalence required should be specified by the Radiological Protection Institute of Ireland, or the local hospital physicist. From the lead equivalence the thickness of Thistle X-Ray plaster can be determined. It is imperative that the specified thickness of plasterwork is achieved, in order to provide the required degree of protection.

Radiological Protection Institute of Ireland,
3 Clonskeagh Square, Clonskeagh Road, Dublin 14.
Phone 01-269 7766 Fax 01-269 7437.

Durability
Thistle X-Ray with a final coat of 2mm Gyproc Skimcoat or Carlite Finish provides a plastering system suitable for moderate to high impact/wear areas.
Background preparation
Surfaces should be reasonably dry, clean, protected from the weather and suitable for the chosen specification. Special precautions are often necessary due to the weight of the system.

Walls
Thistle X-Ray can be applied directly to open textured dense concrete blocks. Other blocks and bricks (typically lightweight or with poor mechanical key) require reinforcement with a suitable rib-lath, fixed in accordance with the manufacturer's recommendations. Concrete lintels within wall structures should be reinforced with expanded metal lath of a suitable type and gauge, again fixed in accordance with the manufacturer's recommendations.

Soffits
Soffits of solid construction (i.e. concrete or pot and beam) or timber joists require reinforcement with a suitable rib-lath.

Mixing
Thistle X-Ray is pre-mixed and only clean water needs to be added to prepare it for use. Mixing should be carried out in a clean tray or bath. Tools and water used in mixing must be clean. Contamination from previous mixes can shorten the setting time and reduce the strength of the plaster when set. Mix by mechanical whisk to a lump-free consistency. If required, small quantities can be mixed by hand.

Application
Thistle X-Ray plaster should not be applied to plasterboards. When plastering directly to suitable walls a total plaster thickness of up to 25mm can be applied using the following method. Floating coats should be applied with firm pressure at a thickness 8mm, wire scratched and allowed to set but not dry between coats. The final floating coat should be ruled to an even surface and lightly scratched to form a key for Gyproc Skimcoat or Carlite Finish.

Thistle X-Ray can be applied to suitable rib-lath to a total thickness of 15mm from the face of the lath in soffits, or to a total thickness of 25mm from the face of the lath in wall applications. Plastering of Thistle X-Ray to metal lath involves first a pricking up coat, which should be forced through the metal lath in order to provide a good key to the lath. The surface of the pricking up coat must be wire scratched to provide a good key and allowed to set but not dry before the floating coat is applied. Floating coats should be applied at a thickness of 8mm up to the thickness required and wire scratched between each coat. The final floating coat should be ruled to an even surface and lightly scratched to form a key for 2mm Gyproc Skimcoat or Carlite Finish.

To give full protection, it is essential that the finished plasterwork is completely crack-free. Thistle X-Ray should be therefore be applied with considerable care. Gyproc Skimcoat or Carlite Finish should be applied as soon as the basecoat has set.

Setting Time
Thistle X-Ray has a setting time of 1.5 to 2 hours after mixing. The exact set time is largely dependent on background suction.

<table>
<thead>
<tr>
<th>Thickness, weight &amp; coverage</th>
<th>Coat</th>
<th>Approx</th>
<th>Approx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backgrounds</td>
<td>Thickness</td>
<td>set &amp; dry</td>
<td>Cov.</td>
</tr>
<tr>
<td>Walls of open textured dense concrete blocks or keyed surface bricks (fletton type)</td>
<td>25</td>
<td>50</td>
<td>19</td>
</tr>
<tr>
<td>Other block/brick walls with rib-lath</td>
<td>25</td>
<td>65</td>
<td>14</td>
</tr>
<tr>
<td>Concrete lintels reinforced with expanded metal lath of suitable gauge</td>
<td>25</td>
<td>65</td>
<td>14</td>
</tr>
<tr>
<td>Soffits of solid construction or timber joist floors - both reinforced with rib-lath</td>
<td>15</td>
<td>40</td>
<td>23</td>
</tr>
</tbody>
</table>