# ABSTRACT

Researchers had developed agrowing interest in strengthening the cylindrical shell by using inside and outside the shell for various shapes for strengthening rings. Cylinders bodies have been widely used in different industrial applications. The prompt and massive technological rise throughout the world has created a need for the use of cylindrical bodies under unnatural circumstances such us, high temperatures, pressures and different heavy loads.

Use of cylinders requires precise design that insures high degree of safety, reduction in thickness and weight; moreover it requires ease of production.

Designers achieve high cylinder strength by using of short and hard cylindrical steel rings inside and outside the shell with section shape suitable for design and performance and can be joined by welding.

In this study Finite elements method was used to study the stress distribution for shells strengthen with steel belts from inside and outside.
t/1 represents the ratio of strengthening length to shell length while.
h/s represents the ratio of strengthening thickness to shell thickness.

It was found that internal strengthening is better than external strengthening, for example, using internal strengthening of (t/1 = 0.1) and (h/s=1.25) results in decreasing the tangential stresses by 18.4%, while using external strengthening with the same dimensions (t/1 = 0.1) and (h/s=1.25) results in decreasing the tangential stresses by only 6.62% while using internal strengthening of (t/1 = 0.25) and (h/s=1.25) results in decreasing the tangent stresses by 36.8%, while using external strengthening with the same dimensions (t/1 = 0.25) and (h/s=1.25) results in decreasing the tangent stresses by only 16. 2%.

It is quite obvious that using internal strengthening is far better and results in decreasing the tangent stresses by three times than use of external strengthening . Moreover, the ratio of (t/1=0.1) is much more better and results in decreasing the tangential stresses by three times than use of bigger ratios

Also It was found that the decrease on misses streesses using internal strengthening is three times more than equivalent stresses using external ones.

Ateching program was designed to achieve the technological side.

This program was depending on the simulation method and using ales and steven method .

The main object of this program was to enable students and other people in this field to learn how to design cylinders for different cases, according to the required system specifications