What is the carbonitration process?

It is a modified version of the carbonitration process. In addition to the carburization process, ammonia gas is introduced into the atmosphere. Carbonitration is “thermochemical” treament that carried out in the temperature range 820°C to 900°C.

It is a heat treatment method that produces a wear resistant surface while conserving the hardness and strength of steel structures.

A harder and deeper hardness layer is obtained compared to the carburization process.
Demsa Heat Treatment carries out carburization process in gas atmosphere controlled band type (Continuous) heat treatment furnaces.

How does the carburization process take place and what are the process details?

The carburization process is based on three main principles.

1 A rich Co and N2 atmosphere is created. Carbon and nitrogen diffusion takes place in the main metal.
It is made to obtain a harder wear-resistant layer on the surface than the core. 0.5-0.9% carbon component and %0,2-0,4 ammonia gas is given to the atmosphere.

Ammonia decomposes in the atmosphere to be $2NH_3 \leftrightarrow N_2 + 3H_2$.
The gas composition consists mainly of CO and N2.
2 Sudden cooling is done in a constant temperature. It is aimed to create martensite structure which is a hard structure in the core.
Special heat treatment oil is used as cooling medium.
It is aimed to minimize distortions that will occur in the material.
3 Tempering process is applied to give the structure ductility and strength.

How to determine the depth of the carburization layer?

Appropriate process data are set according to surface hardness tolerances and hardness depths specified in standards or customer specific conditions. Depth of carbon layer depends on time, temperature, type of steel used and the amount of rich atmosphere in the furnaces.
We can hardening to 0.50mm depth with the carburization process.