Application Logic Table for X7Ni9

Application-oriented reading for typical X7Ni9 use in LNG, cryogenic vessel, transport, and fabricated module duty.

Specific scene	Typical component or duty	What the equipment must do	Why X7Ni9 is selected	Practical technical reading
Large onshore LNG tanks	Inner tank shell courses, bottom plates, annular plates, lower shell-to-bottom transition areas	Store LNG continuously in a large welded containment structure while carrying hydrostatic load and local thermal stress	X7Ni9 is suitable because the inner tank is a **cryogenic welded plate structure**, not a simple room-temperature vessel. The material needs to combine plate strength with reliable low-temperature toughness.	This is one of the most typical 9% nickel plate applications. The decision is driven by **cryogenic containment duty**, not by general structural strength alone.
Inner tank shell in LNG storage service	Shell plates forming the primary liquid boundary	Maintain structural integrity in the cold liquid zone and across circumferential and vertical weld seams	The shell plate must remain tough in low-temperature service and must also remain practical to fabricate and weld in large plate form. X7Ni9 gives a recognized route for this requirement.	In this scene, **welded-joint performance**, **plate thickness**, and **cryogenic toughness verification** are often more important than headline tensile strength alone.
Cryogenic storage tanks for liquefied gas	Shells, heads, nozzle zones, pressure-retaining wall sections	Hold low-temperature media safely while also resisting pressure load and fabrication-related stress concentration	X7Ni9 is selected where the tank is not only cold-service equipment but also a **pressure-containing welded vessel**. It provides a more suitable low-temperature plate route than ordinary pressure-vessel steels.	The logic is strongest where low temperature and pressure duty act together. In these cases, the material route must be read together with the governing design code and impact requirement.
Cryogenic pressure vessels	Vessel shell, heads, reinforcement zones, thicker plate sections	Resist internal pressure while retaining crack resistance at low temperature	The grade is used because cryogenic pressure vessels require more than basic strength. They require a plate route with a proven low-temperature service framework.	This is why X7Ni9 is discussed as a **pressure-vessel plate for low-temperature service**, not as a general-purpose nickel steel.
Transport tanks for cryogenic media	Road or transport tank shells, end heads, welded containment sections	Contain liquefied gas under low-temperature service with repeated filling, emptying, and practical transport duty	These tanks are fabricated from rolled and welded plate, so the material must remain reliable not only in base metal but also through fabrication and weldment performance.	The value of X7Ni9 here is that it supports a **fabricated cryogenic plate structure**, not simply that it contains nickel.
Fuel tanks for LNG or similar cryogenic service	Tank shell and structural plate sections in fuel containment systems	Retain low-temperature liquid safely in a compact welded tank structure	Fuel tanks are smaller than large storage tanks, but the service logic is similar: the material must support low-temperature containment in a plate-and-weld construction route.	The material choice is tied to the fact that the tank is a **real welded cryogenic containment component**, where fabrication quality matters as much as nominal chemistry.
Shop-fabricated cryogenic modules	Pressure-containing plate components supplied as fabricated vessel sections	Deliver a completed cryogenic vessel section with acceptable low-temperature performance after forming and welding	X7Ni9 is useful because the grade supports fabrication into welded plate components without leaving the cryogenic pressure-purpose material route.	This use case is common where the project purchases partially or fully fabricated modules rather than only raw plate.
Field-erected LNG and cryogenic infrastructure	Larger pressure-containing plate structures assembled on site	Maintain service integrity in large welded assemblies where joint behavior becomes critical	In large field-built structures, the material decision must account for both plate performance and the practical realities of welding, inspection, and erection.	Here, the material route must be read together with **weld procedure qualification**, **inspection scope**, and the actual service temperature envelope.