

DOUBLE EAGLE: Setting the Quality Standards for China Leading Lead Thyroid Shield Manufacturer Since 1978



Longkou, Shandong Jun 14, 2026 ([Issuewire.com](https://www.issuewire.com)) - The evolution of X-ray protection in China is deeply intertwined with a legacy of domestic innovation that began over four decades ago. Since 1978, when the first Chinese protective lead apron was developed, the domestic industry has transitioned from a reliance on imported technology to establishing independent manufacturing capabilities. Today, a critical focus remains on protecting highly radiation-sensitive organs, such as the thyroid gland, during diagnostic and interventional medical procedures. As the industry has matured, **DOUBLE EAGLE** has emerged as a benchmark organization, recognized globally as the **China Leading Lead Thyroid Shield Manufacturer**. The modern lead thyroid shield is a specialized, ergonomically structured collar designed to mitigate the risks of scatter radiation for healthcare professionals and patients alike. By utilizing high-density lead rubber elements wrapped in durable, medical-grade fabrics, these devices provide vital attenuation capabilities without compromising the user's mobility or comfort during extended clinical workflows.

I. Foundations of Medical Radiation Shielding in China

The historical framework of contemporary radiation shielding in China was built upon an iterative sequence of technological developments. Prior to the late 1970s, the domestic healthcare infrastructure faced an absence of specialized personal protective equipment (PPE) tailored for radiological environments. The milestone development of the first domestic lead apron in 1978 established a baseline for local manufacturing. This was rapidly followed by the engineering of the QH80 X-ray protective lead apron in 1980, which filled a critical macroeconomic gap and matched the contemporary technological standards of advanced industrial nations like Japan.

By 1983, the expansion into specialized accessories, including X-ray lead protective gloves, prompted the formalization of early enterprise quality standards. To transition from empirical manufacturing to structured, scientific development, a dedicated Rubber and Plastic Research Institute experimental factory was established in 1990. This research hub laid the technical groundwork for complex compounding processes. The enterprise consolidated its corporate identity under the "Double Eagle" trademark in 1994, transitioning into a modern corporate structure designed to meet the rising regulatory demands of both domestic and international healthcare markets.

II. Material Innovations and the Transition to Ultra-Thin Protective Sheets

A primary engineering challenge in lead rubber manufacturing has always been balancing radiation attenuation with material flexibility. Historical shielding garments often relied on heavy, rigid sheets or smaller rubber segments spliced together. This splicing method introduced structural risks, as the seams between segments could thin or separate over time, potentially allowing minute amounts of scatter radiation to pass through.

In 1996, a major technical shift occurred with the successful synthesis of a new type of soft, ultra-thin protective lead rubber sheet. This manufacturing breakdown eliminated the reliance on small rubber splicing by producing continuous, homogeneous matrix sheets. The material achieved a precise, uniform distribution of lead particles within a flexible polymer matrix, significantly mitigating shielding vulnerabilities. This core material innovation became the structural foundation for advanced personal protective wear, allowing for the precise molding required by specialized components like the thyroid collar.

III. Standardization and International Quality Certification

The commercialization of medical medical devices requires strict compliance with international quality management frameworks to ensure reproducible safety metrics. The transition from regional distribution to global standard compliance was solidified in 2001, when the manufacturing infrastructure officially passed the ISO9001 and ISO13485 quality management system certifications. The ISO13485 standard, specifically tailored to the medical device industry, dictates rigorous controls across design, raw material sourcing, production consistency, and trace-forward risk assessment.

These certifications facilitated sustained expansion. Between 2003 and 2008, the underlying polymer

and lead-compounding technologies were adapted to industrial security applications, resulting in the development of specialized lead curtains for X-ray security scanning machines. To accommodate the increasing volume of specialized medical manufacturing, a new 20,000 square meter production facility was constructed within the High-tech Zone Technology Industrial Park in Longkou in 2010. This modern facility centralized the manufacturing pipeline, leading to the formal incorporation of Shandong Double Eagle Medical Device Co., Ltd. in 2013.

IV. Technical Analysis of the Premium Lead Thyroid Collar

Modern clinical applications demand specific performance parameters from radiation shields. Analyzing a representative product case, such as the PC09C American Style Lead Rubber Thyroid Collar, reveals the exact engineering metrics required to meet current safety thresholds. The device is structured to provide targeted attenuation for the thyroid gland, an organ highly susceptible to radiation-induced oncogenesis from chronic low-dose scatter radiation.

Key Technical Parameters and Structural Attributes

- **Lead Equivalent Value:** The primary performance standard is maintained at a standard 5mmPb or 0.35mmPb equivalence. According to third-party testing reports, this standard ensures that the thyroid collar effectively attenuates over 90% of scatter radiation generated during standard fluoroscopic procedures.
- **Ergonomic Geometry:** The American Style configuration features an extended, contoured neckline that follows the human anatomy around the larynx and lower cervical vertebrae. This shape prevents gaps between the apron and the collar during head rotation.
- **Closure System:** It utilizes high-cycle, medical-grade hook-and-loop fasteners that allow for swift, secure adjustments while remaining resistant to liquid penetration and repeated sanitization cycles.
- **Dimension Stability:** The continuous lead-rubber core layer resists sagging, tearing, and cracking under frequent flexing, ensuring long-term uniformity of the protective barrier.

The manufacturing process forces a highly uniform distribution of micro-fine lead particles within a flexible rubber base, avoiding the clustering that causes localized shielding failures. This creates a pliable, high-density shield that conforms tightly to the neck without causing restrictive pressure or neck strain for medical personnel during multi-hour surgical operations.

V. Strategic Clinical Applications and Global Compliance

The utility of advanced thyroid shields spans across multiple high-exposure medical environments. Diagnostic imaging, interventional cardiology, orthopedic trauma surgery, and computed tomography (CT) rooms represent primary application environments where scatter radiation levels pose cumulative health risks to medical practitioners.

Within these settings, personal protective equipment must withstand not only radiation exposure but also harsh clinical maintenance protocols. The outer layer of the shield uses specialized fluid-resistant

fabrics that prevent the absorption of blood, contrast media, and saline solutions. These surfaces can be repeatedly wiped down with standard hospital disinfectants without degrading the internal lead rubber core. By balancing material science, ergonomic design, and strict adherence to international medical manufacturing standards, the industry continues to provide reliable protection for healthcare professionals worldwide.

For further technical specifications or global distribution inquiries, please visit the official enterprise platform at <https://www.doubleeaglexray.com>

Versatile Medical Applications



The PICO® thyroid collar is the ideal protective solution for a wide range of medical professionals and settings.

- Radiology**
For routine X-ray procedures where consistent protection is essential.
- Interventional**
Suits where extended radiation exposure demands superior protection.
- Dental Clinics**
Shielding dentists and staff from scatter radiation during imaging.
- Orthopedic Practices**
Essential during fluoroscopy-guided surgical procedures.
- Highly Recommended**
Specifically for pregnant staff and pediatric patients.

Treated by professionals worldwide for reliable protection and comfort.

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