

## Overall Comparison of Similar Products:

Item	Description	Brand A	Brand B	Brand C	Brand D	ABC Corp Brand E	
1.	Safe to operate	★★★★★	★★★★☆	★★★☆☆	★★★★★	★★★★★	In accordance with operators B: Require great effort when destroyed C: Needle hub uneasy to retract D: Need to snap plunger(cause scraps) E: <b>No such problem</b>
2.	Can be operated easily	★★★★★	★★★★★	★★★★☆	★★★★★	★★★★☆	Operation difficulty A,B,C: Retract directly after engagement D: Need to unlock needle coupler and snap plunger before retraction E: Rotation is needed
3.	Prevention of accidental needle sticks	★★★★☆	★★★★★	★★★☆☆	★★★★☆	★★★★★	Easy to cause accident when the needle is retracted fiercely B: Need to pull plunger fiercely C: Retraction uneasy to control, most likely for needle to fell out of barrel
4.	Prevention of reuse	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	A: Needle destroyed when retracted B: When needle coupler destroyed after retraction, replacement of plunger mat lead to reuse of syringe C: Needle retracted(destroyed) D: Plunger destroyed E: Needle destroyed when retracted
5.	Air residue after medication withdraw	★★★☆☆	★★★★☆	★★★★☆	★★★★★	★★★★★	To see if there are residing air A: May contain residual air between piston and engaging parts
6.	Medication residue	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★★	Less is preferred
7.	Appearance	★★★★★	★★★★★	★★★☆☆	★★★★☆	★★★★★	
8.	Components' accuracy tolerance	★★★★★	★★★★★	★★★☆☆	★★★★★	★★★★☆	A: Force of loosing engagement and retraction uneasy to control B: Needle coupler and barrel uneasy to coordinate C: Needle coupler and barrel uneasy to coordinate D&E: <b>No such problem</b>
9.	Integral structure reliability	★★★★★	★★★★★	★★☆☆*	★★★★☆	★★★★☆	A&B: Needle hub's position and retraction uneasy to control C: Needle coupler and barrel uneasy to coordinate D: Accuracy of needle coupler and ring is doubted E: <b>No such problem</b>
10.	Inclined needle function for destruction of needle	★★★★☆	N/A	★(Not exact)	N/A	★★★★★	A: May not attain angle when engagement is incomplete C: May not attain angle due to swinging E: <b>No such problem</b>
11.	Complies with all FDA criteria	★★★★★	★★★☆☆	★★★★☆	★★★★★	★★★★★	Besides mistaken activated, there are problems such as A: Piston may cause scrap when departed B: Contaminated piston departs from barrel C: Retracting and
12.	Follows all guidelines for safety syringe	★★★★☆	★★★★★	★★★☆☆	★★★★★	★★★★★	sealing problems D: Snapping plunger cause scraps E: <b>No such problem</b>
13.	Positioning of needle coupler definite	★★★★★	★★★★☆	★☆☆☆☆	★★★★★	★★★★★	A: Seal ring of needle coupler hard to coordinate with barrel B: Seal ring of needle coupler hard to coordinate with barrel C: Position of needle hub and barrel hard to coordinate D&E: <b>No such problem</b>
14.	Withdraw problem of needle coupler	★★★☆☆	★★★☆☆	★★★★★	★★★★★	★★★★★	A: Seal ring of needle coupler hard to coordinate with barrel B: Needle hub and needle coupler hard to coordinate with pressed C: Position of needle hub and barrel hard to coordinate D&E: <b>No such problem</b>
15.	Leakage problem of needle coupler	★★★★☆	★★★☆☆	★★☆☆*	★★★★★	★★★★★	A: Seal ring of needle coupler may break when skipping over barrel positioning parts B: Problems may occur when assembling seal ring on needle coupler C: No seal ring designed D&E: <b>No such problem</b>
16.	Reliability of needle coupler stir	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★☆	C: Unsealed Rest of the syringes are identical
17.	Force when plunger and needle coupler engaged	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Weaker force is preferred. A: Slightly strong, but acceptable. B&C: Weak engaging force. E: Medium engaging force
18.	Grip of plunger and needle coupler	★★★★☆	★★★★★	★★★★★	★★★★★	★★★★★	Stronger force is preferred. A: Slightly strong B&C: Strongest D&E: Medium (Force is irrelevant because the needle coupler is locked with plunger when retracted.)
19.	Force of retracting needle coupler	★★★☆☆	★★★☆☆	★★☆☆*	★★★★★	★★★★★	Weaker force is preferred. A: Medium B: Slightly strong C: Strongest D&E: Weakest(Force is irrelevant because the needle coupler is locked when retracted.)
20.	Unintended displacement of needle coupler when retracted	★★★☆☆	★★★★★	★★★☆☆	★★★★★	★★★★★	In accordance with shipping, storage and temperature when operated A,B,C: Cannot assure the function retraction D&E: <b>No such problem.</b>
21.	Leakage problem of piston	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	A: Shallow piston may be deformed B: Shape of piston-trouble in elasticity C: Shape of piston cause trouble in central contact area D: Shape of piston-trouble in elasticity E: <b>No such problem.</b>
22.	Plunger carrying piston away from contamination(before use)	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★★	A: Needle uneasy to depart from barrel B: Plunger easily retracted causing contamination of needle C: May depart when retracted D: May break plunger E: Needle uneasy to depart from barrel
23.	Plunger carrying piston away from contamination(after use)	★★★★★	☆☆☆☆*	★★★☆☆	★★★★★	★★★★★	A: Needle uneasy to depart from barrel B: Plunger must be pulled out, serious contamination C: Easy to depart when retracted D: Plunger snapped E: Needle uneasy to depart from barrel
24.	Leakage problem cause by needle hub and needle coupler	★★★★★	★★★☆☆	★★☆☆*	★★★★★	★★★★★	A: The formation of needle hub and needle coupler hard to control B: Needle coupler may backshift when tighten C: No seal ring between needle hub and barrel, may cause leakage D&E: <b>Can be tightly locked, no leakage problem</b>
25.	Needle hub stirring reliability	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆	C: Lack of seal ring, no stirring occurred
26.	Destroy of plunger	N/A	N/A	N/A	Yes	N/A	This function is included only on Product D (However, snapping plunger may cause scraps)
27.	Prevention of mistaken activation when operated	★★★☆☆	★★☆☆*	★★☆☆*	★★★★☆	★★★☆☆	A: Engaging force slightly strong but acceptable B&C: Cannot prevent due to weak engagement force D&E: Medium engaging force, acceptable( <b>Mistaken activation can be disarmed</b> )
28.	Prevention of mistaken activation when manufactured and shipped	★★★☆☆	★★☆☆*	★★★★★	★★★☆☆	★★★☆☆	A: Engaging force slightly strong but acceptable B: Cannot prevent due to weak engagement force C: Separated needle hub, no such problem E: Medium engaging force, acceptable( <b>Mistaken activation can be disarmed</b> )
29.	Disarm mistaken activation	★★★☆☆	Unable to disarm	Unable to disarm	★★★★★	★★★★★	A: Can manage to disarm using force B&C: Cannot be disarmed D&E: <b>Can be disarmed, no such problem(won't cause waste in medical resources)</b>
30.	Total parts(packaging not included)	8	8	6	9	8	E: plunger, piston(seal), barrel, needle coupler/adaptor, O-ring seal, needle hub, needle, needle protecting cap, a total of eight parts in this product
31.	Variation when stored a period of time	★★★☆☆	★★★★★	★★☆☆*	★★★★★	★★★★★	In accordance with shipping, storage and temperature when operated A: Seal ring of needle coupler hard to coordinate with barrel, causing sealing and retracing problems.
32.	Automation of fabrication	★★★★☆	★★★★☆	★★★★☆	★☆☆☆☆	★★★★☆	B: Seal ring of needle coupler hard to coordinate with barrel, breaking hook of needle coupler, i.e. retracing problems. Production cannot be automated C: Need to assemble needle hub before use, needle hub hard to coordinate with barrel, trouble in sealing and retracting, Production cannot be automated D: Production cannot be automated E: <b>No such problems</b>
33.	Quality assured when manufactured	★★★★★	★★★★☆	★★☆☆*	★★★☆☆	★★★★★	
34.	Yield of production	★★★★☆	★★★☆☆	★★☆☆*	★★★★★	★★★★☆	
35.	Cost of material	★★★☆☆	★★★★☆	★★★★★	★★★★★	★★★★☆	A&B: High accuracy required, hard to manufacture C: Though with fewer parts, still holds problems of A&B D: Excessive parts E: A more desired structure
36.	Cost of production	★★★★☆	★★★☆☆	★★★★★	★★☆☆*	★★★★☆	Evaluated by automated production, stability and yield
37.	Attachment of needle and needle hub	★★★☆☆	★★★★☆	★★★☆☆	★★★★★	★★★★★	B&D: Bought in open markets. The rest of the products require accustomed needle attacher. In accordance with positioning and yield, product E has the most advantages
38.	Integrity of facilities and technology	★★★★★	★★★★★	★★★☆☆	★★★★☆	★★★★★	E: <b>Cover problems of every aspect.</b>
39.	Overall evaluation	★★★★★(4.02)	★★★★☆(3.4)	★★★☆☆(3.17)	★★★★★(4.4)	★★★★★(4.7)	E: Under any and every circumstances the safety functions of the syringe can be assured

<p>A. Product Feature: Parts: plunger, piston, barrel, needle coupler, O-ring, needle hub, needle and needle protecting cap</p>	<p>B. Product Feature: Parts: plunger, piston, barrel, needle coupler, Sealing, needle hub, needle and needle protecting cap</p>	<p>C. Product Feature: Parts: plunger, piston, barrel, needle hub, needle and needle protecting cap The outer part of needle hub coincides with barrel</p>	<p>D. Product Feature: Parts: plunger, piston, barrel, hook, needle coupler, sealing, needle hub, needle and needle protecting cap</p>	<p>E. Product Feature: Parts: plunger, piston, barrel, needle coupler, O-ring, needle hub, needle and needle protecting cap</p>
<p>Note:</p> <ul style="list-style-type: none"> <li>★★★★★ Perfect</li> <li>★★★★ Nearly perfect, no urgent improvements needed</li> <li>★★★ Mechanism acceptable, though need improvement</li> <li>★★ Minor defect, solve immediately for mass production</li> <li>★ Serious defect, should consider redesigning</li> <li>☆ receive half of the credit</li> </ul>	<p>Shipping, storage and temperature:</p> <ol style="list-style-type: none"> <li>1. Shipping process</li> <li>2. Maximum storage: 3 years</li> <li>3. Storage temperature: -10°C~+40°C</li> <li>4. Operating temperature: +10°C~+40°C</li> </ol>	<p>FDA Guideline for Safety Syringe:</p> <ol style="list-style-type: none"> <li>1. It provides a barrier between the hands and needles after use;</li> <li>2. It allows or requires the worker's hands to remain behind the needle at all times;</li> <li>3. It is an integral part of the device, and not an accessory, and</li> <li>4. It is in effect <b>before disassembly, if any, and remains in effect after disposal.</b></li> <li>5. The safety alert also suggests that the device should be simple and easy to use requiring little training.</li> </ol>	<p><b>Features of the Rotary Retractable Safety Syringe and its Functional Advantages:</b></p> <ol style="list-style-type: none"> <li>1. Basis for the Design: The main purpose is to protect the safety of healthcare personnel from accident needle sticks and to match the present healthcare practices to allow for simple intuitive use.</li> <li>2. The needle coupler/adaptor and the barrel have a secure locking mechanism preventing shifting or dislodgement of the needle during withdrawal of medication or during the injection of the medication.</li> <li>3. The force needed to release the needle coupler/adaptor is nominal, thereby lightening the physical burden on the healthcare personnel and allowing easy usage.</li> <li>4. The inclined needle function allows for clear and definite destruction of the needle.</li> <li>5. Simplicity of use prevents mistakes and waste of medical resources.</li> <li>6. Under any and all circumstances, the syringe is safe and effective, and completely complies with all necessary FDA criteria set out in the Medical Equipment Safety Criteria.</li> </ol>	