1. *GENERALS*

Because of the electricity the conductive material dipped in a proper solution afford a chemical performance such as electrodeposition or a mechanical performance such as the surfaces polishing.
the electropolishing treatment turns out to be the fair system to polish the metallical surface as anode. It is widely preferred to the mechanical polishing (e.g. performed by brushes) because the acid bath gives rise a sort of passivation of the stainless-steel therefore an increase of its corrosion resistance.
In particular, the electropolishing might be consider as final treatment and it does not reach such limits as the mechanical treatements by brushes; e.g. any burning spots due to the high friction of the wheels in contact with a low calorific conductivity metal.
The electrochemical treatment do not alter nor scrape nor change any superficial marks due to the trimming, abrasion or stamping.
Just in these cases to erase the marks it is useful to pre-treat the surface by a proper mechanical treatments (e.g. sandblasting, brush-polishing, etc…)

2. *APPLICATION*

The present procedure is suitable to all austenitic stainless steel, in particular on odds and ends or items up to 2,8 metres long. Martensitic and ferritic stainless steel cannot be processed.
Furthermore, it is possible to define then apply new specific jigs in order to treat different kind of geometries and shapes. It is a particular application depending on the shape of the item, on the edges and weldings, on the density of corrent (has to be homogeneous on the whole surface), on the anodic gas flow and the superficial activation. In certain cases it is necessary to process the matherial by a sandblasting step.

3. *PERFORMANCE*

CHEMICAL-CLEANING: this step concerns the items dipping in a heated alkaline-bath or an organic solvent. In fact the organic substances act as insulator against the electronic transfer which is the core of the electrolytic system.

PICKLING: to eliminate the presence of inorganic oxides on the items' surface this step becomes indispensable. The bath consists in a solution of nitric acid (100 g/lt) where the items may stop for about 10 minutes depending on the amount of oxides on the surface.
However this step can be even avoided if the surface does not present any oxides.

RINSING: the rinsing step allows to neutralize the superficial pH therefore with a neutral pH the reactions on the surface are more efficient and it allows to avoid the pollution between different chemical baths. It is performed by a water-flow combined with air-bubbling for at least ten minutes.

ELETTROPOLISHING: it is the process of anodic diffusion through an acid bath which solution has high density and low conductivity (~ 0,5 A/cm^2).
In these conditions the system generates an anodic film close to the surface that induces an higher density of current on the superficial ridges. Hence, the ridges get smoothed because of a removal that level them all, thus polishing as a final effect. The rate of the removal is around 0,5 microns per hour at the standard condition of voltage and temperature. The operative time/temperature is: 20 mins/44°C.

DRYING: depending on the kind of matherial it is performed by a timed and temperature-controlled oven.

SEALING (OPTIONAL): in order to obtain a better product to resist even more against the aggressive agents this step becomes fondamental. It is performed through an item-soakage into emulsifying oil like the white-oil solution or crude oil like Anticorit 77 (Fuchs).