

# Study on Characteristics of Leather by Coating Methods

Seung-Hun Yang, Byung-Wook Min, Soo-Beom Shin, Min-Seok Park

Korea Institute of Footwear & Leather Technology  
536-1 Dongdocheon-dong, Dongdocheon-city, Kyeonggi, 483-080, Korea  
E-mail : shyang@kiflt.re.kr

## 1. Introduction

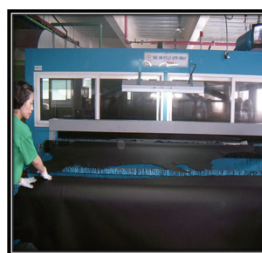
Coating is the final finishing process in leather manufacturing and is an important decisive process that makes a high quality leather. Conventional coating method used in the leather making process is either padding or spray method. Coating by padding or spray, however, causes problems of deteriorating physical properties of the finished leather including adhesion strength and abrasion resistance, air pollution and poor working environment from excessive use of chemicals and energy, leading eventually to economical loss. A new method of coating using high efficiency roll coater has been introduced. In this method, unlike the conventional synchro-driven system used in fiber or electronic industries, roll is rotated in reverse direction considering the non-existent shape stability of the leather for enhancing the physical properties of abrasive strength and flatness of leather and grading up the quality. This method has proven saving power cost by 54% and chemical costs by 51% respectively compared to the conventional spray method.

## 2. Experimental

In this study, a leather of 1.0~1.2mm thick was coated by Spray M/C and Roll coater to check the characteristics of the finished leather through observation of physical properties and product rejection rate. Also, carried out study to develop a process in Roll Coater that feeds the leather while smoothing out and that separates the stuck leather easily after coating.

**Table 1.** Experiment by Coating Methods

Division	Spray process	Roll coater process
1step	1st sprayed coat	Main roll coating
2step	2nd sprayed coat	Embossing
3step	Embossing	Top color coat
4step	Sprayed top coat	-



(Spray process)



(Roll coating process)

**Fig. 1.** Preparation of Leather Coating Manufacturing Methods

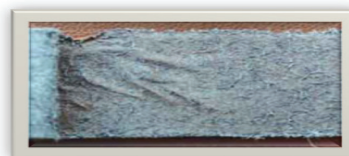
## 3. Conclusion

### (1) Study on Physical Properties

In order to observe physical properties of adhesion strength and abrasion resistance of the leather undergone Spray coating and Roll coating, results of the both methods are shown in Table 1. It could be seen that Roll Coating Method gave excellent results in abrasion test and peel test. Fig.2 shows the test result of adhesion strength by coating methods.

**Table 2.** Physical Properties

Division	Spray process	Roll coater process
Abrasion test (Taber type)	186 mg loss	8 mg loss
Adhesive strength test	2.8 kgf/cm <sup>2</sup>	5.6 kgf/cm <sup>2</sup>
Tensile strength test	1.8 kgf/mm <sup>2</sup>	2.1 kgf/mm <sup>2</sup>



(Spray process)



(Roll coating process)

**Fig. 2.** Test results of Adhesion Strength

## (2) Economy by Coating Methods (Chemicals and Power Cost)

Amount of chemicals used for coating 100 sheets of leather crust by spray method and roll coater respectively was checked and power costs for operating the equipments for one (1) hour in both methods were also checked. Table 3 shows the results.

**Table 3.** Costs of Chemicals and Power by Coating Methods

Division	Spray process	Roll coater process
Consumption of chemical products	230L/100	113L/100
Consumption of electric power	41kw/hr	19kw/hr

Also, in order to reduce product rejects from use of roll coating equipment, a study was carried out to develop process that feeds the leather into the machine while smoothing out and that separates easily the stuck leather after coating for use in leather coating of various purposes.

## 4. Reference

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2. Mullen, T. C. J. *Soc. Leather Trades'Chem.*, 46, 162(2006)