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CENTRAL INTELLIGENCE AGENCY

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1. The Czechoslovak rubber and leather industries are conducting research on the problem of finding domestic substitutes for imported raw materials and of improving methods and products of the manufacturing process. Research is directed mainly at the improvement of the quality of plastics and synthetic rubber. In the leather industry special attention is being given to research directed at a greater utilization of polyvinylchloride as a substitute for leather in the manufacture of shoes and of artificial leather made from a textile base. Attempts are being made to increase the use of domestic and synthetic tannins in place of imported tannins. Research in the rubber industry is concerned mainly with the use of the chloroprene rubber component of plastics in the manufacture of thermosets and the improvement of plastics for replacing such scarce materials as non-ferrous metals and India rubber.

Task I. Problems in the Field of Plastics

2. The following list represents the 1951 research plan for the leather and rubber industries:

No.	Title	Purpose	Planned time of completion	Cost in Kcs
03.09.70a	The use of novodur (sic) as a substitute for non-ferrous metals, refined alloys, leather and India rubber	To decrease imports of non-ferrous metals, refined alloys, leather and India rubber. To conserve foreign exchange.	30th week 1951 (28 July)	30,000.-
03.09.70a	Processing of thermoset compounds for large stampings (about 20 kg) with regard to low specific weight, great strength, resistance to atmospheric conditions, absorbency, etc.	To find substitutes for scarce materials; to achieve high productivity; to utilize giant presses.	1954	60,000 for the part planned in 1951

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No.	Title	Purpose	Planned time of completion	Bonus in Kcs
03.09.70b	Processing of thermosets by presses and spraying presses (lisostrik) into 20 kg units.		1954	
03.09.76	Gelatinization a) continual gelatinization of thermoplasts b) gelatinization of layers on textile with the help of vf (sic).	To rationalize the manufacturing process, improve quality, substantially decrease further capital investment and operating costs.	a) 40th week 1951, (6 October) b) 20th week (19 May)	40,000

Research is being carried on by:

Research Institute for Plastics (Vyskumny ustav plastkarske technologie) at Napajedla
 Research Institute for Leather, Rubber and Plastics (Vyskumny ustav kozedelný, gumarenský a plastikarský) at Gottwaldov
 Czechoslovak Chemical Plants (Československé chemické závody) at Prague
 Plastimat, National Corporation at Jablonec nad Nisou

Task II. Artificial Leather Production Research

10.06.07a	Artificial leather from polyvinylchloride (PVC) a) preparatory processes b) Copolymers (kopolymer) of vinylidenchloride for the preparation of artificial leathers.	To solve production of artificial leather by impregnation methods, by pressing sheets of foil between textile flecce. To substitute for imported raw materials.	a) September 1951 b) June 1951	45,000
10.06.08	Textile-base artificial suede	To introduce into the manufacture of footwear a new product whose quality would equal foreign products	20th week, 1951 (19 May)	40,000
10.06.17a	Fibrous artificial leather a) chemical research and adjustment of copolymers b) preparation of fibrous material and its processing.	To prepare a suitable material for artificial leather; to prepare artificial leather satisfying the requirements for an ideal material used in the manufacture of footwear	1952	55,000 for the part planned for 1951

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics at Gottwaldov
 Czechoslovak Chemical Plants at Prague
 Czechoslovak Textile Plants (Československé textilní závody) at Prague
 Research Institute for Plastics at Napajedla

Task III. The Processing and Use of Plastic Materials

10.07.19	Use of PVC in shoe manufacture.	To substitute for leather and rubber, to conserve foreign exchange, improve the quality of products and to rationalize production processes.	1951	30,000
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No.	Title	Purpose	Planned time of completion	Bonus in Kcs
	I.a) PVC soles for winter shoes		19 May 1951	
	b) PVC soles for children's shoes		6 Oct. 1951	
	c) PVC crepe		Dec. 1951	
	d) vulcanized seam (celosvarovana) footwear		Dec. 1951	
10.07.19b	II. PVC welts for winter footwear		30 June 1951	
10.07.25	PVC suitable for vulcanization, as a substitute for India rubber	To substitute for India rubber used sealing and shock-absorbing purposes in the automobile industry to substitute for rubber used for special technical purposes. To conserve foreign exchange.	2 June 1951	

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics at Gottwaldov.

Task IV. Chloroprene (chloroprenovy) Rubber Production Research

10.10.15a	a) Working out the details for and introduction of analytical controls	To solve technologically the preparation of hard rubber for the purpose of increasing economy, the quality of the product, and the safety of the production process. To eliminate heavy labor, and to improve working conditions.		100,000 for 1951
10.10.15b	b) Isolation of chloroprene			
10.10.15c	c) The elaboration of the production of monomer (sic).			
10.10.15d	d) Polymerization of chloroprene			
10.10.15e	e) Preparation of hard rubber (pevny kaucuk).			

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics at Gottwaldov
Czechoslovak Chemical Plants at PragueSectional Problems*Task I. Problems Concerning Plastic Materials

No.	Title	Purpose	Planned time of completion	Bonus in Kcs
03.09.53	The fusion of novodur and the fusion of novodur with other materials: a) novodur with metal, heat resistant to 80° C, cohesion(pevnost) 80 kg/cm, b) novodur upon novodur, strength 60% of original material c) novodur with concrete d) plastic with wood, e) PVC with textiles	To prepare fusion agents for the fusion of vinyl-chloride materials with other materials (metal, wood, concrete, textiles). To conserve foreign exchange.	1951	110,000

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No.	Title	Purpose	Planned time of completion	Bonus in Kes
03.09.68	The use of plastic materials for wrapping a) tubes b) wrappers for food industry	To find material which satisfies the requirements for wrapping materials, especially resistance to temperature during a freezing process. To conserve imported materials.	1951	20,000
03.09.69	Continuous spraying of thermosets (profiles, pipes)	To rationalize production to introduce products (pipes for hot lyes and acids). To improve productivity.	1951	20,000
03.09.74	Working up of PVC compounds by means of injections into closed molds (uzavrene formy) using standard injecting (vstrikovaci) machines	To find production methods for PVC products made by injections into closed molds. To conserve foreign exchange and materials.	1951	30,000
03.09.03	The fusion of softened PVC with softened PVC and with other materials a) Igelit with Igelit, b) Igelit with leather, c) PVC with textile, cotton and umstriz (umstriz).	To elaborate glues for fusion: 1) PVC-PVC 2) PVC-leather 3) PVC-textiles 4) top leather based on PVC treated with chloride. To conserve foreign exchange.	1951	15,000
03.09.104	Methods of production of elastic porous material from plastics: a) sponges b) airplane wing inserts to limit vibrations.	To work out compounds and methods of production from domestic raw materials. To achieve thermal and sound insulating material with low specific weight and chemical resistance. To conserve foreign exchange, especially that expended for India rubber and sponges.	1951	15,000

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics at Gottwaldov
Research Institute for Plastics at Napajedla
Sigma National Corporation
Czechoslovak Chemical Plants
CZTS**

Task II. Photochemistry

03.18.01	Tasks in Research of photogelatin	To improve the quality and produce new kinds of photogelatin, using other raw materials, e.g. pig and goat glues.	standing problem	30,000 for 1951
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Research is being carried on by:

Czechoslovak Chemical Plants at Prague
Research Institute for Leather, Rubber and Plastics, Gottwaldov

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No.	Title	Purpose	Planned time of completion	Bonus in Kes
<u>Task III. Leather Industry Research</u>				
10.04.01	Salvage of albumin leftovers (zbytku bilkovin)	To manufacture a new kind of protein material for the leather industry. To transform second-rate or less valuable leather into a coherent (souvisly) material out of which an endless belt is formed and gradually chemically processed and adjusted. In this way it is hoped to attain real tanned hide in the form of an endless belt. To utilize second-rate materials for a superior product, and lessen losses in shoemakers' workshops.	Nov. 1956	25,000 for 1951
10.04.02	Use of artificial tannins during chemical tanning processes (trislocineni).	To examine finished tannins for their tanning efficiency and ascertain the maximum need for individual types of hides. To conserve foreign exchange	Standing problem	25,000 for 1951

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics, Gottwaldov

Task IV. Auxiliary Material for Tanning Industry

10.07.01	Introduction of partial (poloprovozni) production of various acrylates (akrylatu), eventually copolymers from metacrylates (metakrylaty)	To establish partial production of suitable dispersions for tanning purposes from acrylates or their copolymers from metacrylates. To conserve foreign exchange.	1952	45,000 for 1951
10.07.04	Research in the production of artificial tannins a) perfection of DL tanning b) finding a method of manufacturing tannins out of double (dvojmocnych) phenols.	To conduct research in the use of the most suitable material for production of tannins	standing problem for 1951	120,000

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics, Gottwaldov
Czechoslovak Chemical Plants at Prague

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No.	Title	Purpose	Planned time of completion	Bonus in Kcs
<u>Task V. Rubber Industry Research</u>				
10.13.01	(Buna) compound research a) perfection of buna compounds for carcasses of a quality equal to the natural material.	To obtain a basis for composition of buna compounds, for tread (behoun) and carcasses of tires in order to obtain better quality and longer wearing products. To increase buna consumption.	1951	35,000
10.13.03	Utilization of rubber industry waste with the exception of regenera- tion (regenerace) a) isoprene b) various alifatic (sic) carbohydrates used as fuel or as solvents c) technological preparation	a) To ascertain the possibilities of chemical treatment of old rubber (preparation of isoprene or some alifatic carbo- hydrates). Isoprene could be used for the preparation of mixable polymers which have India rubber qualities b) Technological treat- ment. To ascertain possibilities of using old rubber or rubber textile, for certain kinds of compounds. The purpose is to treat rubber industry waste which has not yet been utilized and of which there are about 3,000,000 kg and thus to find a way to decrease India rubber imports.	1953	40,000
10.13.05	Utilization of rubber industry waste- regeneration a) perfection of the method of high-pressure regeneration and placing in operation	To perfect high-pressure regeneration and to enable large production of the regenerator. Better use of the rubber regenerator; conservation of foreign currency.		

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics, Gottwaldov.

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No.	Title	Purpose	Planned time of completion	Bonus in Kcs
<u>Task VI. Technological Research</u>				
10.15.02	Drying of hides by infra-red rays.	To ascertain suitability of drying varnishes in processing top hides and in processing of footwear with final polish (apretura) with the help of infra-red rays. To ascertain the possibilities of belt system preparation of hides. To speed up the processing of hides and footwear.	1951	20,000
10.15.04	Research of dynamic qualities of India rubber compounds and products a) static tests b) India rubber compounds for elastic settings (sic), tightenings (sic), tank wheels, V-belts, transmission belts, etc. c) evaluation of the results of tests and a choice of typical compounds	To evaluate and complete the existing compounds used in the sector CZKG. Possibility of substituting buna for India rubber.	1951	40,000 60,000

Research is being carried on by:

Research Institute for Leather, Rubber and Plastics, Gottwaldov
Czechoslovak Chemical Plants at Prague
CZTS

Regional Problems*

Problem No.	Problem	Planned completion of project
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Task I. Problems of Chemistry and Organic Technology

03.07.259	Exploitation of the tanning industry's chemically processed leather waste. Previous title: exploitation of leather waste. a. Aminoacids and their derivatives	1951
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Task II. Problems in the Field of Plastics

03.09.56	Use of resins (thermosets) suitable for hardening. Compounds for footwear purposes (ladies' heels and wedges).	1951
03.09.81	Use of methylmethacrylates	1951
03.09.106	a) Preparation of pasts (sic) from PVC b) Composition of compounds of PVC (selecting colors, ascertaining values for high and low temperatures).	1951
03.09.105	Low-pressure laminated (vrstvene) materials	1951
03.09.107	Use of polyvinylchloride latex	Nov. 1951
03.09.108	Insulation of columns (sloupec)	Nov. 1951

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Problem No.	Problem	Planned completion of project
<u>Task III. Tanning Industry Research</u>		
10.04.04	Improvement of production of velour (velourovych) hides	1951
10.04.05	Continuation of the study of the drying of hides by gluing (lepenim)	1951
10.04.06	New possibilities of adaptation of hides with the use of water acrylic dispersions.	1951
<u>Task IV. Preparation and Dying of Furs</u>		
10.05.02	Lubrication for hides and furs	1951
10.05.07	Improvement of luster of the hair in beaver imitation fur	July 1951
10.05.08	Improvement of Paunofix adaptation	July 1951
10.05.09	Development of anilin black without steam treatment	Aug. 1951
10.05.10	Fixing the optimal quantity of peroxide for dying	Aug. 1951
<u>Task V. Research in the Manufacture of Artificial Leather and Shoemakers' Cardboard (lepenek)</u>		
10.06.01	Improvement of quality of artificial leather made from ground hide waste	Standing problem
10.06.02	Improvement in shoemakers' cardboard production	Standing problem
10.06.03	Introduction of the production of artificial inner soles from cellulose impregnated by glues	1951
10.06.06	Artificial chloroprene leather	1951
10.06.12	Utilization of dyed tanning (vylouzene trislo) for production of cardboard	1951
10.06.13	Exploitation of pig and cattle hides for uppers (vrchova kuze)	1951
<u>Task VI. Auxiliary Material for the Tanning Industry</u>		
10.07.15	Improvement of quality of shoemakers' polish (apretura)	1951
10.07.17	Manufacture of synthetic waxes for shoe polishes from lanolins and other raw materials	1951
10.07.18	Manufacture of lubrications based on chlorine-treated naphthalenes with a low melting point	1951
<u>Task VII. Shoemakers' Glues</u>		
10.09.01	Soluble carbamide resins (formerly formite and its applications)	1951
10.09.02	Gluing of artificial leathers of all kinds	1951
<u>Task VIII. Chloroprene Rubber Production Research</u>		
10.00.07	Use of by-products chloroprene rubber manufacture	1952
<u>Task IX. Rubber Industry Materials Research</u>		
10.13.02	Influence of the composition of compounds on the qualities of rubber a) heat-resistant compounds b) oil-resistant compounds c) hygienically harmless compounds	1951
10.13.09	Impregnation of textiles in the rubber industry a) cords b) textile fibers including glass	1951

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Problem No.	Problem	Planned completion of project
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Task X. Technological Research

10.15.04a	Application of dielectric heating in the rubber and plastic industries	1951
10.15.04b	Vulcanization of PVC heels on PVC soles Application of Vf(sic) in the manufacture of sprayed goods	1951
10.15.06	1) production of PVC heels by spraying 2) vulcanization of rubber hoses, thread, etc. Application of thermomechanics in the field of leather, rubber and plastics	Standing problem
10.15.19	Use of latex a) micropress separators b) latex packings (tesneni) c) soaked goods (macene zbozi)	1951

Task XI. Machine Equipment Research for the Leather, Rubber and Plastics Industries

11.26.150	Ascertaining of the construction basis for a spraying machine, 250-500 mm in diameter	1951
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Task XII. Research on the Functions of Existing Water Works

16.02.05	Filtration stations used for tanning industry waste water	1951
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Task XIII. Research on Waste Water

16.02.35e	Chemical filtration of tanning industry waste water	1952
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Task XIV. Man and his Surroundings

20.11.06	Research on hygienically harmless footwear (Research and solution of hygienically harmless footwear)	1960
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Plan of Technical Development in the Rubber and Leather Fields

The plan of technical development in the leather and rubber fields is directed mainly toward the introduction of several new manufacturing processes in the field of synthetic materials. The newly acquired products will replace non-ferrous metals in the construction of various technical devices, as well as replace India rubber and leather with synthetic materials.

The realization of these manufactures will decrease our dependence on imports from abroad and the supply of domestic raw materials shall increase. The improved working up of domestic raw materials, such as artificial suede and pig split leather, will enable the exploitation of domestic raw materials to a greater extent than previously. The introduction of suggestions for improvement for the adaptation of glove hides offers a better exploitation of second-rate material and will enable exports. Mechanization is fully provided for within the framework of technical planning. The introduction of quantity and quality norms aims at better exploitation of products, simplification of production and an increase in productivity.

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Plan for the Realization of Results of Scientific Research

No.	Problem	Place	Starting Time	Quantity	Influence on the Economy
1.	Continuous shearing of thermoplast profiles	Fatra Napajedla	2/1/1951	90 tons	Replacement of metals, especially non-ferrous, in industrial equipment
2.	Manufacture of artificial suede in the field of electric statics	VU Svit Gottwaldov	20th week (19 May '51)	gradually to 150 m ² per week	Better exploitation of material, probability of export
3.	Production of lubricants on a chloride-naphthalene base	VU, CZKG	June, '51	Beginning 48th week, 200 kg per day	Replacement of natural and mineral lubricants, decrease in imports
4.	Glues for footwear repairs	Svit	Jan., '51	300 kg weekly	Saving of work on pegging (kolickovaci) machines, simplification, increase of repair efficiency
5.	Production of PVC soles	Svit	Jan., '51	2.5 million pairs per year	Increase in production economy, saving sole hides, better exploitation, decrease in import
6.	Production of PVC welts	Fatra Napajedla	Jan., '51	2.6 million pairs per year	(same as above)
7.	Production of cellulose inner soles	VU, CZKG	March, '51	550,000 m ² per year	Complete substitute for leather
8.	Exploitation of pig split leather	VU, CZKG	April, '51	105,000 m ² per year	Exploitation of split leather, a wider store of hides, a better market supply

Plan of Extension, Introduction and Realization of Essential Improvement Suggestions

No.	Improvement Suggestion	Savings in Kcs	Branch of Industry Affected	Date of Introduction
1.	Preparation of glove hides by spraying with acryl resins	5,600,000 in home factories, export not estimated	Leather Industry, production of glove hides	Depends on delivery of butylacrylate from CCZ which is under urgent consideration

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Plan for Norms and Standardization (Typisacni)

No.	Title of Suggested Norm	Kind of Norm	a) Director for Suggested Norm b) Executor of Suggested Norm (a & b on General Management)	Plan Executing Work	Time Limit	Purpose
1.	Truck tires for Advencet rims	size quality	a) Lastovicka b) Snizek	Pneu, NP Gottwaldov	30 Nov	Longer wear, quicker assembling, simplified production of CZTS rims
2.	Auto leather	size quality	a) Lastovicka b) Kabrt	Platina, Jablonec	30 Oct	16% improvement of quality (export), improvement of the manufacturing process
3.	V-belts (klineve remeny)	quality	a) Lastovicka b) Kovarik	Svit, Gottwaldov	30 Nov	6% longer wear, removal of complaints, ensuring quality, use of belts according to regulations, 5% production saving (50% of production is exported)
4.	Rubber hoses	size quality	a) Lastovicka b) Kovarik	Svit, Gottwaldov	30 Nov	Decrease in number of sizes, unified construction, 15% production saving, 20% equipment saving, 30% prolonged wear (14% of production is exported)
5.	Conveyor belts	size quality	a) Lastovicka b) Kovarik	Svit Gottwaldov	31 May	Decrease in number of sizes larger series in production, increase of production by 20% limitation of stocks by 50%, 8% greater wear, 20% export.

Ceramics

Research ceramics plan problems, in so far as their solution within the framework of the Czechoslovak Glass Works is concerned, concentrate mainly on electroceramics problems for both weak current and strong current electric industries. These problems originate especially from the needs of the heavy machine industry and the weak current electrotechnical industry.

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General ProblemsTask III. High Frequency Ceramics Research

No.	Problem	Purpose	Planned completion of problem	Bonus
07.57.15	Low-loss (nizkostratovy) steatite especially from Slovakian raw materials	To ensure production from domestic materials, and thus abolish dependence on imports	Dec. 1951	40,000 Kcs
07.57.16	Rutile (rutilovy) material research	To find out the dependence of electrical qualities on ceramics manufacturing techniques and on the quality of raw materials. Replacement of present firing by another method.	Dec. 1951	40,000
07.57.17	Titanate material research with regard to the thermodependence of high frequency electric characteristics (dielectrics) with a small thermodependence of dielectric constants.	To ascertain the dependence of electric characteristic on ceramics manufacture techniques and on the quality of raw materials.	Dec. 1951	40,000
07.57.18	Research of materials with dielectric constants higher than 1000 (E-2-5000 at 1 Mc)		Dec. 1951	40,000

Research is being carried on by:
 Vyzk. elektrokeramicky zavod, at Hradec Kralove
 Elektrokeramika n.p., at Prague

Task IV. New Ceramics Materials Research for Radio and Electrotechnology

07.57.13	Materials of great mechanical strength for high-tension insulators	To reduce and simplify the present number of types, and thus increase production capacity and lower the production cost.	Dec. 1951	30,000
07.57.20	Materials with great mechanical strength for high and very high-tension power poles	(Same as above)	Dec. 1951	30,000

Research is being carried on by:
 Vyzkumny elektrokeramicky zavod, at Hradec Kralove

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No Regional Problems.

Plan for the Technical Development of General ProblemsPlan for the Realization of the Results of Scientific Research Work
(Introduction of new materials and production processes)

Name of Task	Place of Realization	Beginning of Realization	Production Quantity	Effect on National Economy
Substance with dielectric constant E-2000tg Delta 3 x 10 ⁻²	Vyzkum. pracoviste techn. porc., at Hradec Kralove; Elektrokeramika, at Klenci	30 Nov. 1951	Cannot be stated yet since the VTU does not give the quantity. Originally it was 20-30 tons	Independence from imports, conservation of foreign exchange.

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* **Comment:** There are three kinds of problems in research: general, sectional (those concerning the industrial sector), and regional. General problems are the most important since they are of national importance. The government directs their realization. All the lists, orders and papers concerning these problems are written on red paper. All documents concerning sectional problems are written on green paper. They are controlled by the ministry concerned. Regional problems are written on white cards. These research problems are important for a single national enterprise, and are controlled by the Ministry. All research projects are also controlled by the VUVTR (Central Office of Research and Technical Development). Dr. Vlcek is vice-chairman of the VUVTR; the chairman of the VUVTR is Dr. Fukatko.

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** **Comment:** This may be the Czechoslovak Heavy Machinery Plants National Corporation (Ceskoslovenske zavody tezkého strojírenství).

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